REVIEW AND APPROVALS

BENTON LAKE NATIONAL WILDLIFE REFUGE

Great Falls, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

James E McCollum 3/15/94

Project Leader Date

Associate Manager Review Date

Regional Office Approval Date

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INTRODUCTION

Benton Lake is a 12,383 acre refuge located on the western edge of the northern Great Plains some 50 miles east of the Rocky Mountains and 12 miles north of Great Falls, Montana. Benton Lake proper is a 5,000 acre glacial lake bed which is the terminus of a 145 square mile watershed. Refuge terrain is gently rolling with shortgrass native prairie being the predominant vegetation. Three mountain ranges are readily visible from the refuge; the Highwood Mountains to the east, the Big Belt Mountains to the south and the Rockies to the west.

The climate is generally temperate with wide fluctuations in temperature and precipitation. Summer highs may soar to near 100 degrees F while winter lows may reach -50 degrees F. Rain and snow are erratic with the area averaging approximately 15 inches of precipitation a year. Extremely windy conditions occur in the fall through spring, due to frequent Chinook winds blowing from the southwest along the Rocky Mountain front.

The refuge was established by Executive Order in 1929 as "a refuge and breeding ground for birds". Little development of the refuge occurred until the station was staffed in 1961. At about this same time, a pumping station was established 30 miles to the west to bring return irrigation flows to the refuge. This additional water source has helped eliminate the boom and bust cycle of the refuge marshes, generally assuring some water even in times of severe drought. Waterfowl production has averaged about 20,000 in the past several years.

The lake itself has been divided into eight marsh units to provide better water control for the enhancement of submergent and emergent vegetation and limit botulism outbreaks. Water management is generally by gravity flow, although an inter-unit pumping system allows for great flexibility, especially in the advent of a botulism outbreak.

Refuge wildlife is dominated by water birds including most major species of ducks, Canada geese, gulls, terns and various shorebirds. Mallard, gadwall and pintail are the major duck nesting species. The refuge is an important migration stop during spring and fall with up to 100,000 ducks, 5,000 tundra swans, 40,000 snow geese and 3,000 Canada geese present. Bald eagles are commonly seen in spring and fall.

Other refuge wildlife includes twenty different species of mammals such as jackrabbits, muskrat, mink, raccoon, weasel, coyote and a limited number of white-tailed deer, mule deer and pronghorn. Only a handful of reptile and amphibian species are present, and no sizeable fish due to the shallowness of the marshes.

Land use around the refuge is intensive agriculture with wheat being the principal crop grown. The area from Great Falls north to the Canadian border is known as the "Golden Triangle" of Montana. The fallow cropping system employed over much of the area is causing problems with refuge water quality by accelerating salinity and trace element accumulation. Changing private land use practices in the watershed is a major challenge of the years ahead.

The Benton Lake Wetland Management District and the Montana Partners for Wildlife program are also administered from the refuge. Details are found in the District narrative following the refuge section.

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K. FEEDBACK NTR

On December 6th Vince Marko reached the 30 year milestone with the Fish and Wildlife Service. Vince has spent his entire career at Benton Lake and has worked for all seven refuge managers.

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1993 NARRATIVE REPORT

A. HIGHLIGHTS

1. Near record summer precipitation results in reduced water pumping and improved wetland conditions. Section F.2.

2. Duck nesting success averages 64% Mayfield. Section G.3.

3. No avian botulism occurred in 1993. Section G. 17.

4. Engineering Equipment Operator Vince Marko completed his 30th year with the USFWS.

5. A California/ring-billed gull food habit study provides little data on the impact of gull predation on other migrator birds. G.5.

B. CLIMATIC CONDITIONS

The year started out cold and snowy with the coldest temperature of the year, minus 25, recorded on January 13th. The greatest snow depth of the year, seven inches, occurred in the second week of January. February was also quite cold averaging 8.1 degrees below the monthly normal of 27.4. March was much warmer and dryer with a new high temperature record of 74 degrees set on the 23rd. April had above normal temperatures but was the third wettest on record. May was nearly normal for both temperatures and precipitation.

The summer months saw numerous records for cold and wet. June was the third coldest on record with a new record low of 39 on the 25th. July and August were both the coldest on record and resulted in the three months being marked as the coldest in over 100 years of record keeping in Great Falls. In addition the summer was very wet, the sixth wettest on record with 10.30 inches recorded in the three months.

September, October and November followed the trend of cool and wet but were not record setting. The trend reversed in December with minimal precipitation and temperatures averaging 9.6 degrees above normal. Total annual precipitation of 23.01 turned out to be the third wettest ever. There was no snow on the ground at year's end.

TABLE I

WEATHER DATA - 1993

	GREAT FALLS					REFUGE
	Temperature (F)		Precipitation			Precipitation
	High	Low	Total	Depart	Snow	Total
January	55	-25	1.17	+ .26	14.7	1.05
February	54	-16	.70	+ .13	10.7	.52
March	74	-01	.86	- .24	7.0	.44
April	66	24	3.16	+1.75	4.4	2.31
May	84	33	2.74	+ .22	T	1.83
June	89	34	2.58	+ .19	0	2.91
July	93	41	4.68	+3.44	0	4.77
August	90	35	3.04	+1.50	T	2.44
September	82	28	1.71	+ .47	T	1.18
October	81	12	1.10	+ .32	3.8	.60
November	55	-12	.97	+ .31	13.0	.62
December	60	12	.30	- .55	4.2	.23
1993	93	-25	23.01	+7.80	57.2	18.90

C. LAND ACQUISITION

1. Fee Title

There were no land acquisitions for refuge purposes this year. Work began on a new draft preliminary project proposal for acquisition of both fee tracts and easements near the refuge in the Lake Creek watershed. The objective of the project would be to provide protection to the existing resource values of the refuge, primarily wildlife habitat and water quality.

D. PLANNING

2. Management Plans

A draft plan prepared for management of upland habitats on the refuge was submitted to the Regional Office for review late in the year. The plan recommends several changes in upland habitat management toward more active management and away from the long-term rest that has been practiced since 1976.

4. Compliance with Environmental and Cultural Resources Mandates

The annual Section 7 review of the refuge hunting program for effects on endangered species found no impacts. The review did not recommend any changes in the hunting program.

A Section 404 permit was requested and received from U.S. Corps of Engineers for a drainage improvement project in marsh unit 3. The purpose of the proposed work was to provide better water management and improve capability to completely draw the unit down for botulism control and manipulation of vegetation. An Environmental Assessment Evaluation was completed after consultation with the Ecological Services office in Helena. We determined that a complete Environmental Assessment was not necessary.

5. Research and Investigation

Calming Troubled Waters: Contaminants at Benton Lake National Wildlife Refuge. A Plan of Action. 1991. Benton Lake NWR, Black Eagle, Mt.

Former Refuge Manager Don Hultman wrote the Contaminant Action Plan as "a bridge between the necessary world of research and the practical, down-to-earth methods of land management to solve the contaminant problem". The plan provides an overview of the contaminant issues, research and accomplishments to date, and identifies future plans, funding needs and target dates.

Two general contaminant problems exist including the salinization of the refuge marshes and the accumulation of trace elements such as selenium.

The goals of the Plan related to contaminant cleanup are:

1) Maintain or reduce levels of trace elements such as selenium, boron and mercury at levels which pose no threat to species using Benton Lake. For selenium, the objective is 2μg/L or less for all waters entering the lake (above this level selenium begins to bioaccumulate in a system).

2) Maintain a salinity level of no greater than 6,000 μS/L in any of the refuge marsh units, and no more than 5,000 μS/L for all units combined, when water is at planned management levels in any given year. Salinity above 5,000 μg/L begins to change the aquatic plant community thus affecting current marsh productivity and poses a risk to mallard duckling survival.

The Helena Field Office USFWS Ecological Services has the lead in refuge contaminant cleanup. This year $210,593 was spent. The following is an excerpt from the ES FY 1993 Progress Report On Benton Lake NWR Contaminant Cleanup.

"Nine actions have been determined to be necessary to reach the goals and objectives of contaminant abatement at Benton Lake NWR. The following is a progress report on each of these actions".

Action 1: Determine the refuge's water budget

In 1991, the U.S. Geological Survey began work through an intra-agency agreement with the Service to determine the processes controlling dissolved solids, the rates of accumulation of salts in Benton Lake, and the potential for dissolved-solids concentrations to reach detrimental levels in the future. By 1992, the USGS had determined that:

1) based on 22 years of refuge data, annual average runoff to Benton Lake is estimated to be 3,550 acre-feet;

2) dissolved solids concentrations range from 516 to 7,740 mg/L (median of 2,090 mg/L) and commonly decreased during the period when relatively dilute water was pumped into the refuge from Muddy Creek; and

3) dissolved solids are not being removed from the system by leakage of lake water to ground water.

In 1993 water quality samples were collected eight times during the ice-free season to characterize snowmelt runoff, baseflow, and pumped water. Discharge and specific conductance of streamflow was measured continuously at the Lake Creek gage. Samples were also collected from the tributary to Unit 4 of Benton Lake to help better define the loading of dissolved solids to the refuge from the ungaged part of the basin.

The USGS is also continuing to work on determining the fate of dissolved solids once they have entered Benton Lake. Salts appear to be lost from Benton Lake; two possible mechanisms for explaining this loss are 1) that salts are carried away from dry lake beds by strong winds and 2) that salts precipitate in the lake-bed sediments when units dry out but do not redissolve when a unit is refilled. The means by which the USGS is attempting to confirm or refute the above possibilities include:

1) collecting time-series data on the salt content of the lake bed and correlating that with the timing of salt addition from added water or periods when lake beds are dry and subject to wind erosion;

2) determining water and salt budgets from the discharge and specific conductivity data for inflows;

3) collecting lake water samples for major-ion analysis; and

4) performing laboratory experiments with lake water to recreate, under controlled conditions, the mineral precipitation and dissolution reactions that occur in Benton Lake.

Data tabulation has begun for a project report. The report will be prepared this winter and will summarize the investigation and make recommendations concerning strategies for managing salinity at the refuge.

The University of Montana's investigation of selenium distribution in Benton Lake is ongoing. Findings in 1992 indicated:

1) the highest concentrations of selenium are found in the Lake Creek channel and decrease radially away from the mouth of the channel both in solution and sediment;

2) selenium concentration decreases with sediment depth; and

3) there is significantly higher concentration of selenium in channel sediments than on the margins in the cattail marsh.

The study continued in 1993 with the following information gains:

4) water from Muddy Creek contains low Se concentrations, about 2 ppb, and sediment about 1.1-1.3 ppm;

5) the source of the selenium in the wetland system is predominantly from soluble selenate input from Lake Creek;

6) the distribution of selenium species is complex, but is dominated by organic Se in nearly all environments;

7) major change in Se speciation is the reduction of Se from soluble selenate to particulate organic Se;

8) selenium is very likely methylated and volatilized into the atmosphere and/or bioaccumulated in the aquatic food chain;

9) the above reactions occur very rapidly, generally within a few days or at most a month;

10) selenium oxidation and mineralization is occurring as well, but is likely much less important than the organic transformations; and

11) preliminary research on cattails shows that leaves contain less than 1 ppm Se, large roots contain about the same, but small roots contain very high concentrations up to 5 ppm Se.

As this study continues, we hope to learn, at a minimum, the rate of volatilization (methylation) of Se from the sediment and the relationship between selenium concentrations in sediment and in benthic insects.

Action 2: Identify all seeps in refuge watershed

Through the use of aerial photos and Soil Conservation Service maps, a detailed map has been completed which shows land use and the location of all seeps within the 148 square mile Benton Lake watershed. Land use delineations are cropland, idle/range land, land enrolled in the Conservation Reserve Program, and Service land. Total seep area in the watershed has been estimated to be 2000 acres.

A technical report is being written to accompany the map. The report and map will be inserted into the Benton Lake Contaminant Action Plan. Once the report is done this action will be considered complete.

Action 3: Institute systematic sampling plan

Permanent sampling sites were established in Spring 1993 on the refuge and on Lake Creek for monitoring water salinity. Each permanent site was marked with a steel fence post and numbered tag. Surface water salinity monitoring has been done in the past but became more systematic in Spring 1993. Systematic measurements of water levels in the wells associated with the pilot project, south of the refuge, also began in spring 1993. Invertebrate sampling, for monitoring levels of selenium and other toxic elements, was conducted in each unit during summer 1993; sites have not been permanently marked since the location of invertebrate populations varies with fluctuating water levels.

The sampling schedule set for 1993 consisted of visiting all surface water salinity testing sites once every two weeks, from spring run-off until the water freezes. Well levels were also measured bi-weekly; monthly measurements will continue through the winter. This schedule will continue in the 1994 field season. Invertebrate sampling in all units will be conducted again during the 1994 field season.

The framework for a written sampling plan was established during Winter 1992-93. Plan completion is scheduled for Winter 1993-94.

Action 4: Watershed protection

As noted in the 1992 Progress Report, this action was revised to propose three Service-sponsored land management programs for watershed protection - wildlife extension agreements, wetland and grassland easements, and fee acquisition. The grassland easement currently in use in the Region for habitat protection around wetlands needed to be modified to effectively address the situation at Benton Lake. A revised easement, titled Easement for Watershed and Wildlife Habitat Conservation, was drafted and sent to Realty for review in June 1993.

A revised Preliminary Project Proposal will be prepared by Benton Lake staff by March 1, 1994 for submission to the Regional Office. The new PPP will reduce the acreage proposed for fee acquisition from the original PPP which was prepared in 1990 and will place more emphasis on easements in the watershed. After the PPP is approved, the revised easement document will be finalized and incorporated into efforts to gain landowner support for land management changes.

Progress on this action will be closely associated with that of Action 6.

Action 5: Add refuge biologist to Benton Lake Complex staff

As in 1992, there are still two Service employees whose work efforts focus primarily on implementing contaminant cleanup at Benton Lake NWR - a temporary Wildlife Biologist located at the refuge and the full-time permanent Assistant Environmental Contaminant Specialist, located in Helena.

Action 6: Reclaim saline seeps in Lake Creek watershed

As noted in the 1992 progress report, saline seep reclamation involves two steps: 1) identifying the seep's recharge area; and 2) establishing permanent cover on the recharge area through cooperative agreements with the landowners. Progress was made on both steps 1 and 2 in 1993.

Last year's progress report suggested that our initial reclamation work would focus on two areas which contain earlier Salinity Control Association (SCA) projects. Although these two areas will still probably be included in our initial efforts, our strategy has changed somewhat. The watershed has been divided into seven areas to address seep reclamation. The factors used to determine the order in which each area should receive attention are: 1) proximity to the refuge; 2) landowner interest in the area; 3) proximity to the Lake Creek channel; and 4) abundance of idle/range and Conservation Reserve Program (CRP) acres in the area. Crop and CRP acreage in seep recharge have been estimated for the seven priority areas.

The pilot reclamation project discussed in the 1992 Progress Report is located in priority area 1. Since the initial alfalfa planting did not become well established, the area was reseeded in early spring 1993. Alfalfa is now well established on this acreage and will hopefully remain so for three or more years, as prescribed in a letter of agreement with the landowner.

Water levels in the pilot project wells have been recorded every 2-4 weeks during the field season since February 1991. Since 1991 (a dry year), the data collected indicates that there has been a decline in the amount of groundwater flowing through the recharge area covered by the pilot project. With the assistance of USGS personnel, a schedule was established for bailing select wells on a quarterly basis (all pilot project wells will be sampled on at least an annual basis) and measuring conductivity. This sampling schedule was put into effect in March 1993. The data collected will document any changes in ground water salinity as the pilot project progresses.

At the close of FY93 the Service entered into a cooperative agreement with the Salinity Control Association primarily to facilitate coordination with landowners. Together, we have chosen to focus initial efforts on the four priority areas adjacent to the refuge. The Salinity Control Association will take the lead in landowner contacts and may recommend drilling additional wells to more closely identify recharge areas.

FY94 efforts will emphasize gaining landowner support for land management alterations and further investigating funding sources. Action 6 will be revised in response to the changes made in Action 4 last year. The revised action will focus on options for land management change other than those available through the Service.

Action 7: Construct an outlet canal from Benton Lake to Missouri River

It is too early in the cleanup process to address this action.

Action 8: Ensure a more stable supply of water for the refuge

As noted in last year's progress report, the Bureau of Reclamation was asked to evaluate the engineering feasibility of a siphon which would draw water from the Greenfields Irrigation District up to an elevation which would allow the water to gravity flow to the refuge without the need for pumping. In October 1992, the Bureau produced a Preliminary Appraisal Design Report for the siphon. This report indicated that siphon construction would be feasible from an engineering standpoint. The cost estimate for this structure is approximately two million dollars.

A final siphon design and cost comparison to long-term pumping is the next step in this investigation. The Bureau has estimated that this next step would cost $50,000. We may solicit additional bids for this project.

Action 9: Address contaminant problems on Waterfowl Production Areas

During the past two years nine Waterfowl Production Areas, in the Benton Lake Wetland Management District, have been sampled in an effort to determine the extent of trace element residues in the sediment and aquatic invertebrates. Data analysis is scheduled to take place this winter. When analysis of samples from both years is complete, we will be able to determine which areas warrant the highest priority for seep reclamation. A technical report will be written which includes a summary of the data and recommendations for remedial action.

COOPERATORS:

Benton Lake NWR and Wetland Management District, U.S. Geological Survey, Montana Salinity Control Association, U.S. Bureau of Reclamation, University of Montana, Montana State University, Greenfields Division of the Sun River Irrigation Project, U.S. Soil Conservation Service, Agricultural Stabilization and Conservation Service.

E. ADMINISTRATION

1. Personnel

Two staff members received promotions after their positions were reviewed and job descriptions rewritten. Refuge Assistant Betty Benway received a promotion to GS-7 after a region-wide audit of Refuge Assistant positions revealed that her duties and responsibilities merited the higher grade. Partners for Wildlife Biological Technician Greg Neudecker was appointed to a new wildlife biologist position in the Partners program. Greg will serve as the assistant coordinator of the Montana Partners for Wildlife office.

An internal administrative change designated Gary Sullivan as the Special Projects Coordinator for the complex. Gary's new duties include working on projects such as the Blackfoot Watershed Initiative, the Rocky Mountain Front Coalition and the Lonesome Lake Wetland Project. Bob Johnson replaced Gary as manager of the Wetland Management District.

Erich Gilbert was hired in March on a one year appointment as a biological technician to work on refuge contaminant issues. He also assisted in a wide variety of refuge management activities. His costs were covered by funding from Ecological Services. Robert Jordan was hired as a seasonal biological technician in April. Bob's work spanned a wide range of activities including nest predator trapping, upland nesting bird nest searches, duck banding, work on several MMS projects and computer data entry.

Cooperative Education trainee Emily Miwa, a student at the University of Montana, worked from late May until mid-December. Emily worked duck banding, duck nest searches, computer data entry, fence maintenance on WPAs, weed control, waterfowl surveys, and a wide variety of activities typical of the refuge work program.

Table II below indicates the staffing pattern at the Benton Lake office over the past few years while Table III lists staff assigned to the Complex in 1993.

TABLE II

STAFFING LEVELS AT BENTON LAKE NATIONAL WILDLIFE REFUGE WETLAND MANAGEMENT DISTRICT AND MONTANA PARTNERS FOR WILDLIFE 1988-1993

Fiscal Year	Permanent	Temporary Or Seasonal	YCC	Total FTE's
1993	9[1]	4	2	10.7
1992	9[1]	1	2	9.3
1991	8[2]	1	2	8.3
1990	6	2	1	7.2
1989	6	4	2	7.5
1988	6	3	2	8.2

[1] Includes 2 FTE's for Montana Partners for Wildlife

[2] Includes 1 FTE for Montana Partners for Wildlife

BENTON LAKE STAFF

Back row - McCollum, Martin, Tiplady, Johnson, Gilbert, Marko, Benway, Miwa
Front row - Peterson, Metcalf, Jordan, Stutzman, Brewer, Sullivan, Neudecker

Coop Student Emily Miwa received on-hands experience in many refuge and wetland district functions including removing debris from the pumphouse intake screens.

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TABLE III

PERSONNEL ASSIGNED TO BENTON LAKE NATIONAL WILDLIFE REFUGE WETLAND MANAGEMENT DISTRICT AND MONTANA PARTNERS FOR WILDLIFE 1993

Name	Position	Grade	EOD	Depart
		Permanent Staff		
Elizabeth A. Benway	AdmnAsst	GS-7	07/28/68	
Gale F. Brewer	MaintWorker	WG-8	10/03/92	
Robert F. Johnson	WetlandsMgr	GS-9	04/21/91	
Vincent J. Marko	EngEquipOpr	WG-10	04/30/62	
Stephen J. Martin	AsstProjLdr	GS-11	01/29/89	
James E. McCollum	ProjLeader	GS-12	06/12/91	
Gregory A. Neudecker	PFWAsstCoord	GS-7	04/07/90	
James Stutzman	MTPFWCoord	GS-12	01/12/92	
Gary L. Sullivan	SpProjCoord	GS-11	02/01/87	
		Temporary Staff		
Erich Gilbert	ContamBioTech	GS-5	03/21/93	
Tim Tiplady	PFWBioTech	GS-5	02/08/93	
Robert Jordan	BioTech	GS-5	04/12/93	12/16/93
Emily Miwa	StudentTrnee	GS-4	05/16/93	12/25/93
Julie Peterson	YCC		07/12/93	08/20/93
Owen Metcalf	YCC		07/12/93	08/20/93

2. Youth Programs

The refuge again hosted two Youth Conservation Corps enrollees beginning July 12. They were Julie Petersen and Owen Metcalf, both of Great Falls. They provided significant assistance on duck nest searches, duck banding, weed control, and numerous other refuge projects.

4. Volunteer Programs

This was an active year for volunteers at Benton Lake.

Elizabeth Nichol, a biology major at Notre Dame University, spent 2 1/2 months as a volunteer at the refuge from May 24th through July 30th. Liz assisted with the refuge biological program including duck nest studies, California and ring-billed gull study, shorebird surveys and duck trapping and banding.

Dianna McFadden, a junior biology student at the College of Great Falls, volunteered her time while conducting a California/ring-billed gull food habits study (see Section G. 5).

Seven individual volunteers contributed 1550 hours this year compared to 654 hours in 1992. In additional to biological support the volunteers also contributed time to the YCC program, computer data entry, noxious weed control and clerical support.

YCC enrollees Julie Peterson (2nd from left) and Owen Metcalf (right) assisted with duck banding during July and August.

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5. Funding

Budgets for three activities (Refuge, Wetland Management District, and Partners for Wildlife) are consolidated into one allocation for the Benton Lake Complex. Funding in 1993 was adequate to accomplish the essential operations and maintenance programs of the Complex. The following tables provide a summary of overall funding levels for the past 5 years and how those funds were expended by subactivity in 1993.

TABLE IV

ANNUAL FUNDING FOR THE BENTON LAKE REFUGE/WMD COMPLEX 1989 - 1993

Funding	1993	1992	1991	1990	1989
Refuge/WMD	521,500*	564,570**	456,800	409,300	344,000
Partners for Wildlife	400,000	340,000			
	921,500	904,570	456,800	409,300	344,000

*includes $55,000 in funds controlled by Regional Office and expended by other stations.
**includes $108,200 in funds controlled by Regional Office and expended by other stations.

TABLE V

FUNDS AVAILABLE AND FUNDS EXPENDED BY SUBACTIVITY IN FISCAL YEAR 1993

Subactivity	Fund Target	Funds Obligated
1120 PFW Private Lands	330,000	329,884
1230 PFW Migratory Birds	50,000	49,825
1261 Refuge Operations	266,100	266,022
1261 Coop Student Funds	5,000	4,999
1261 Regional Office Funds	10,000	9,808
1261 Refuge YCC	2,800	2,800
1261 PFW Challenge Grant	20,000	20,000
1262 Refuge Maintenance	111,000	110,962
1262 Refuge MMS	67,200	67,195
1262 Regional MMS Funds	45,000	45,001
8610 Quarters	11,400	3,060*
9120 Fire Mgt	3,000	2,990*
TOTALS	921,500	912,546

* funds not expended in FY 93 are carried over into FY 94

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6. Safety

Safety meetings were held quarterly. No lost time accidents or other serious incidents occurred this year.

7. Technical Assistance

Consultations with the Soil Conservation Service were primarily related to water quality efforts. There was continuing work on developing an inter-agency cooperative approach to dealing with contaminants in the Benton Lake, Lake Creek and Muddy Creek watersheds. A cooperative agreement was signed between the Service and Montana Salinity Control Association to facilitate water quality improvement work in the Lake Creek watershed. Refuge staff attended several meetings related to erosion control proposals for Muddy Creek. Most of the erosion problems in Muddy Creek are downstream from the refuge pump station. However, we are interested in proposed solutions because of our water rights on the stream and our concern for future effects of unabated erosion on the stream.

8. Other Items

Training and administrative meetings always seem to occupy a significant amount of staff time each year. Table VI lists the staff attendance this year.

TABLE VI

BENTON LAKE COMPLEX STAFF TRAINING & ADMINISTRATIVE MEETINGS CALENDAR YEAR 1993

Course/ Meeting	Dates	Location	Staff Attending	Staff Days
LE Inservice	February	Marana, AZ	Johnson, Martin, Sullivan	15
Refuge Compatibility Training	02/21-23	Denver, CO	Martin, McCollum	6
Refuge Training Academy	02/22-03/23	Charleston, SC	Neudecker	13
Partners in Flight	02/26	Great Falls	Martin	1
National Private Lands Workshop	03/01-04	Granada, MS	Stutzman	2
Montana Action Group Meeting/Spring Waterfowl Tour	05/03-05	Malta, MT	Johnson, Stutzman, Tiplady Neudecker, Sullivan,Gilbert	15
Fire Mgmt for Line Officers	05/3-7	Minneapolis, MN	McCollum	5
Workforce Diversity	05/11-12	Great Falls	Benway, Brewer, Marko	6
Wetland Restoration & Enhancement Workshop	05/23-27	Fergus Falls, MN	Tiplady	5
Workforce Diversity	06/01-02	Salt Lake City, UT	Neudecker	2
Law Enforcement Requalification	08/18-19	CM Russell NWR	Johnson, Martin, Sullivan	5
Zone I Project Leader Meeting & Workforce	08/23-28	Rock Springs, WY	McCollum	6
Montana Action Group Meeting	09/13-14 09/13-14	Glasgow	McCollum, Sullivan, Stutzman	4
Partners in Flight	10/1	Helena	Martin	1

F. HABITAT MANAGEMENT

2. Wetlands

Good snowpack and spring and summer rains brought much needed runoff to the refuge. Runoff measured at the USGS gaging station on Lake Creek totaled 2070 acre-feet (AF) during March, April and May and 909 AF during June, July, August and September. An additional 70 AF was estimated from water right "C" (Unit IVa) bringing the total 1993 runoff to 3049 AF. This compares with 21, 943 and 911 acre-feet in 1992, 1991 and 1990 respectively. Total refuge runoff in the past 19 years has averaged approximately 3550 AF.

Significant rainfall during July and August also contributed 105, 71, 225, 137 and 99 AF to marsh units III, IVb, IVc, V and VI respectively. These figures were not runoff events but simply due to rainfall events.

Supplemental water from Muddy Creek/Greenfields Irrigation District was not needed until late summer. Pumped water was distributed to units IVc, V and VI during August and September. Electricity costs to pump 1676 AF totaled $14,204 or $7.35/AF.

Most runoff and all pumped water enters Unit I and consequently it had a fairly consistent water level throughout the year. Runoff received after May 1st was retained until July 15th and then transferred to Unit II and held there until the threat of botulism had subsided.

Levels in Unit I were raised slightly in September to facilitate duck banding. Units I and II had high waterfowl use during late fall since they were the last units to freeze. Each unit contained slightly more water than planned at the end of year.

Unit III received a small amount of runoff which provided additional habitat for duck pairs and migrating shorebirds. Levels were allowed to draw down after April 1st in anticipation of the planned construction of ditches for positive drainage and dewatering flexibility. Quick drawdowns are crucial to minimize mortalities during outbreaks of avian botulism. This unit traditionally experiences avian botulism but none occurred this year. The cool wet weather was believed responsible for the lack of botulism but also forced the postponement of the project until 1994. Because the project was delayed until next year the unit had far less water than planned although some water was added in mid-August to facilitate duck banding. This additional water provided ideal conditions for several thousand long-billed dowitcher, lesser yellowlegs and other shorebirds.

Unit IVa received runoff adequate to maintain fair water levels throughout the season. A proposed Ducks Unlimited Project in this unit will provide greater flexibility in water management by allowing water to be transferred from Units I and II. The project was originally scheduled for construction in 1990 but has been rescheduled for 1994.

Unit IVb received 173 AF of Lake Creek runoff in March and 130 AF of water from Unit II in July. Emergent plant cover continues to increase throughout the unit including a good stand of cattail along the interunit/canal dike. Levels at year's end were higher than planned.

Unit IVc was the only unit where winter snow melt was known to contribute to water received. An increase of 164 AF, not attributed to runoff, was detected after thaw and prior to the transfer of 318 AF of Lake Creek runoff. Wetland conditions were again conducive to several thousand nesting Franklin's gulls that established a colony in alkali bulrush. Fall pumping delivered 356

March runoff brought 1530 acre feet of water to the refuge marshes.
SJM 03/93

AF to help accommodate the fall waterfowl migration and hunting season. Year end levels were slightly above those planned.

Unit V received the bulk of spring runoff in March, 831 AF, which provided ideal conditions for migrating ducks and shorebirds. Fall pumping delivered 411 AF of water to facilitate fall migration and waterfowl hunting. Year end levels were slightly less than those planned.

Unit VI received a small amount of water during the spring and 548 AF in the fall. The marsh was allowed to drawdown naturally in early August as a precaution against botulism. No botulism was known to occur. Franklin's gulls nested again in a large colony in alkali bulrush located in the northwest portion of the marsh. Surplus water allowed this unit to be held at a higher level at the end of the year than planned.

The refuge marshes at year's end contained 971 AF more water than in January. Refuge water totaled 4173 surface acres (SA) (3771 AF) in December compared to 3698 SA (2800 AF) in January.

5. Grasslands

DNC fields 1 (60 acres) and 2 (110 acres) were force account seeded in April. These fields were the first DNC planted on the refuge in the early 1970's. Since their establishment these fields were left idle and were in need of rejuvenation. Both fields were coop-farmed during 1989-90 which provided weed free seed beds for this springs alfalfa planting. Good spring moisture provided excellent conditions for alfalfa germination and growth. Field 2 became infested with wild oats and mustard and was mowed twice during the summer.

The use of haying to rejuvenate DNC was initiated in 1991 on three decadent DNC fields. These fields also had remained idle since their establishment 16 to 18 years ago. The legumes were essentially gone and the grasses were slowly dying out. Large amounts of litter and significant areas of bare soil were present under the litter layer. Field 5 was hayed in 1991 and half of fields 6 and 7. The remaining portions of these fields were hayed this year by special use permit. Fall interseeding with alfalfa was not possible due to moisture and was postponed until next spring. A special use permit was issued to a private seed company for the harvest of tall and pubescent wheatgrass seed on a portion of DNC 7. The refuge share of 40% was provided as cleaned and sacked seed.

DNC 4 (40 acres) was prescribed burned on April 15th and was force account interseeded with alfalfa on the 22nd. The purpose of the burn was to invigorate the grasses and prepare a seed bed for the alfalfa. The field was originally seeded in 1976 with a grass mixture that didn't include a legume.

8. Haying

Haying along the Bootlegger Trail, a county maintained road that bisects the refuge, was conducted by refuge neighbor Ron Lee who cut and baled four miles of the right-of-way this year in July. Haying is considered routine highway maintenance to help prevent blowing and drifting snow accumulation on the road during the winter. Haying is delayed until mid July to allow birds nesting in the right-of-way an opportunity to hatch their eggs.

9. Fire Management

No wildfires occurred on the refuge this year. A single prescribed burn was conducted in April (See F.5).

The refuge rotary mower was used for weed control in this newly seeded DNC field.
RFJ 06/93

Manager McCollum ignites a strip headfire in a prescribed burn of a 40 acre DNC field.
SJM 04/93

Interesting how you guys get cattails growing in the sky in Montana. DB
I guess that's why they call it "Big Sky Country."

Quite unexpectedly, American avocets were attracted to the prescribed burn of DNC 4. You learn something new every day!
JWS

04/03

Stutz:
Get your camera fixed
Bill W.

He's been creative - sort of

10. Pest Control

Spotted knapweed (Centaurea maculosa), musk thistle (Carduus nutans) and Canada thistle (Cirsium arvense) at the Muddy Creek Pump Station were treated with Curtail (clopyralid). Four quarts were applied to four acres. Two acres of Canada thistle on the refuge were treated with two quarts of Curtail. One half acre of Hoary cress (Cardaria draba) along the Lake Creek Flats was treated with Roundup (glyphosate).

Non-chemical control employed included hand pulling of leafy spurge (Euphorbia esula) and the mowing of Canada thistle at scattered locations. Musk thistle scattered over three acres was also pulled by hand.

Biological control was employed with the release of 100 Canada thistle stem mining weevils (Ceutorhynchus litura) on a dense thistle patch along the Lower Marsh auto tour route. This site was also the location where 100 seed head weevils (Larinus planus) were released in 1992. Several plants near the release site exhibited signs of stem damage in late summer but the success of these releases will need to be evaluated on an annual basis.

G. WILDLIFE

1. Wildlife Diversity

Wildlife diversity is enhanced by management practices that emphasize waterfowl production and maintenance. Diverse plant communities ranging from xeric grasslands to mesic wetlands provide habitat characteristics essential to migrant species as well as for those species that breed on the refuge.

One special project that is expected to augment wildlife diversity is the bluebird nest box program initiated in 1990. The local Audubon Chapter monitors and maintains 17 boxes on the refuge. Nesting in previous years has included house wrens and tree swallows but none of the boxes were occupied this year.

2. Endangered and/or Threatened Species

Peregrines were sighted nine times during the year in April, May, June, August and September. Two of the sightings occurred during spring and six during fall migration. The only summer observation was an immature bird sighted on June 10th.

Bald eagles were sighted on ten occasions. Single adult birds were sighted on two occasions in April, once in October and three times in November. Pairs of adults were sighted once in March and November and an adult and subadult pair were observed in March.

3. Waterfowl

Ducks

Mallards and pintails began arriving in late February and peaked on April 3rd at 7,600 and 12,400 respectively.

Refuge duck production estimates were derived from nest dragging data. *Mayfield nest success* was determined on a representative sample of habitats and expanded to the entire refuge.

Habitats sampled included 52 acres of Dense Nesting Cover (DNC), 300 acres of native grassland (NGL), 24 acres of shoreline and 20 acres of dikes. Nest dragging was conducted twice from May 5th-18th and June 3rd-18.

Species composition of the 646 nests found and the number of nests in each habitat type are shown in Table VII. Mayfield nesting success was 48%, 67%, 59% and 67% for NGL, DNC, shoreline and dikes respectively. The combined average for upland nests was 64% compared to 50% and 38% in 1992 and 1991 respectively. The higher success this year is attributed to low numbers of mammalian nest predators, primarily striped skunk and raccoon (See G.15).

Nest densities included .22, 4.0, 1.9 and 11.5 nests/acre for NGL, DNC shorelines and dikes respectively. NGL had the lowest success rate of all habitat types which is believed to be partially due to predation by crows. Although NGL also had the lowest nest density, it comprises the majority of habitat acreage on the refuge and therefore contributes significantly to duck production estimates.

Non-systematic searches were also conducted on two three acre islands in conjunction with a California/ring-billed gull study (G.5). Foot searches found 5 nests (1.7 nests/acre) on the gull island and 112 (38 nests\acre) nests on the island not occupied by gulls. Nest success was equally different with the gull island experiencing 25% apparent success compared to 81% (68% Mayfield success) on the non-gull island. One interesting aspect of duck nesting on these islands was that 60% of the nests were northern pintails, a species not often associated with island nesting at Benton Lake.

Refuge duck production estimates were calculated by using nest success and density to determine the number of successful nests for each habitat type. The number of nests were multiplied by a brood survival rate of 75% and an average 5.41 ducklings to flight stage. Island nesting was based on an estimated 500 nests and a success rate of 75%.

The resultant figures for each habitat were combined to arrive at an overall production estimate of 11,653 ducklings to flight stage.

This estimate does not include estimates for overwater nesting ducks such as mallard, redhead, canvasback and ruddy ducks.

TABLE VII

SPECIES AND NUMBER OF NESTS BY HABITAT, 1993

Species	No.Nests DNC	No.Nests NGL	No.Nests Shore	No.Nests Dikes	No.Nests Islands	Total
Gadwall	124	25	19	80	18	266
N.Pintail	44	19	12	11	70	156
N.Shoveler	31	13	6	21	4	75
BW/Cin.Teal	7	3	7	58	1	76
Mallard	6	0	0	24	24	54
A.Wigeon	1	0	0	2	0	3
L. Scaup	0	0	1	12	0	13
Redhead	0	0	0	2	0	2
GW Teal	0	0	0	1	0	1
TOTAL	213	60	45	211	117	646

Dark Geese

Canada geese began arriving in early March and peaked at 325 on April 16th. A Canada goose nest survey, the first since 1989, was conducted systematically on units IVb and V and incidentally on four other marshes. A total of 87 nests were located with an average apparent nest success on 29 nests of 76%. These data were used to expand the refuge estimate to 160 nests that produced approximately 450 goslings to flight stage.

Canada goose numbers during early fall ranged from 800 to 1200 and peaked at 6,000 on December 14th.

White Geese

Snow geese began arriving in early March and peaked at 150 on April 8th. A flock of 175 Ross' geese was sighted on April 28th. Fall flights peaked on November 17th with a flock of 7000 snow geese and a few Ross'.

Swans

Tundra swans began arriving on March 8th and peaked at only 80 birds on the 29th. Spring swan numbers were well below the average of 1200 birds during the last four years. One possible explanation for this year's low swan use was the excellent wetland conditions present throughout west-central Montana. Observers on spring easement flights reported numerous

wetlands north of Great Falls with many swans. Fall swan migrations were more "normal" with a peak of 2700 on November 1st.

4. Marsh and Water Birds

Marsh and water birds known to nest on the refuge include eared grebe, pied-billed grebe, western grebe, black-crowned night heron, double-crested cormorant, sora and Virginia rails and white-faced ibis.

Western grebes nested on the refuge in 1989-90 but no nesting occurred in 1991, 1992 or 1993. A single dead adult grebe found in the spring of 1991 may have been the male or female that nested on the refuge in previous years.

Double-crested cormorants nested on the gull island in Unit IVb last year but no nesting occurred this year. The gull study may have created too much disturbance for cormorants to nest.

5. Shorebirds, Gulls, Terns, and Allied Species

Nesting California and ring-billed gulls have increased significantly on the refuge since 1989. Nearly all nesting has been confined to one of two three acre islands constructed by Duck's Unlimited for nesting waterfowl. Gull nests totaled 1200 and 3481 in 1990 and 1991 respectively and this year 2984 nests were found. A 1991 gull control permit request to treat eggs with white mineral oil was denied. Control efforts requested included the treatment of 3481 nests with white mineral oil to prevent the eggs from hatching. The permit request was denied by the Regional Office since the "take" permit would have included 10,443 gull eggs (3 eggs/nest) which was considered a "politically sensitive issue".

The island's duck nesting cover has been virtually eliminated. Duck nest searches on the island revealed only 12 and 5 nests in 1992 and 1993 respectively. Searches in 1992-93 on a non-gull occupied island, identical in size and 1/8 mile away, revealed 21 and 112 nests respectively.

Another concern is "what will be the level of predation by gulls on young of the year birds such as shorebirds and waterfowl?" Known cases of gull predation on ducklings include two ducklings found in a gull nest in 1990 and the observation of an adult California gull killing and eating a gadwall duckling in 1991.

To gain additional insight into gull predation a California and ring-billed gull food habits study was designed and initiated this spring. Volunteer Diana McFadden, a biology student at the College of Great Falls, conducted the study from May 13th-June 25th. She visited the island on 26 occasions to inspect nests for food items and to record observations at individual nests from a spy blind.

Results of the study were inconclusive regarding the level of predation by gulls on young-of-the-year migratory birds. Results from nest checks on foot failed to provide insight on what foods were being fed to chicks. When gulls return to their nest they regurgitate foods items that are immediately eaten by the chicks or re-swallowed by the feeding adults if a neighbor gull attempts to "steal" the food. Food not eaten by the chick is picked up by the adults. Food items are consequently seldom found at the nests.

Observation from the spy blind resulted in the only known food items fed to chicks. A total of 52 hours were spent in the spy blind during May and June. During this period 30 marked California and 30 ring-billed nests were observed and food items fed to chicks were recorded.

Volunteer Liz Nichol enjoying a brief rest from the confines of the gull study blind.
SJM 05/93

Observations of feeding at non-marked nests was also recorded but observation time emphasized marked nests. The most common food items were invertebrates, including aquatic insects, larvae or grubs, worms, grasshopper and beetles. They comprised 51% and 49% of identified foods fed ring-billed and California gull chicks, respectively. Unidentified food items comprised 22% of the foods fed to both species. Food items seen infrequently included, fish, mice, wheat, corn, garbage, crawfish, small birds (i.e., passerines), gull eggs and gull chicks.

Future gull food habit studies will benefit by knowledge gained this year. Suggested changes include the following, 1) Emphasize California gulls, place a mobile spy blind closer to California nests, most nests under observation this year required the use of a spotting scope, 2) Begin observations in June and continue into July when young-of-the-year shorebirds and ducks are most plentiful and when food needs of growing gull chicks might require larger prey items, 3) Eliminate checking nests for food items, 4) Spend more time in spy blind during each island visit. The average number of feedings observed this year was about 5/hour. A minimum of two hours per visit is recommended.

Benton Lake was one of the original U.S. Fish & Wildlife Service refuges nominated in 1990 for inclusion into the Western Shorebird Reserve Network (WHSRN). Although the refuge was nominated, additional shorebird use data was needed to substantiate that a minimum of 20,000 shorebirds visited the refuge annually to qualify as a regional site.

Since the original nomination, attempts have been made to determine shorebird numbers, species and seasonal use of the refuge. Only during 1991 were surveys complete and extensive enough to document shorebirds in excess of 20,000 birds. Actual shorebird visits to the refuge on an annual basis are probably closer to 40-50,000.

In December 1993 the refuge was contacted and informed by the WHSRN that they were pursing the nomination process for membership of regional sites. Shorebird data for 1991 was submitted at year's end to WHSRN requesting the formal designation of Benton Lake as a regional site.

Formal surveys were not conducted this year. Adequate surveys need to be conducted during spring and fall migrations and during mid-summer to detect peaks of individual species. If the refuge receives WHSRN designation then a formal shorebird monitoring program will be developed for inclusion into the Refuge Wildlife Inventory Plan.

6. Raptors

Raptors confirmed nesting on the refuge this year included Swainson's hawk, northern harrier, short-eared owl and burrowing owl.

Other raptors sighted included bald eagle and peregrine falcon (See G.2), golden eagle, gyrfalcon (gray phase), prairie falcon, merlin, sharp-shinned hawk, red-tailed hawk, ferruginous hawk, rough-legged hawk, great-horned owl and snowy owl.

7. Other Migratory Birds

Lark buntings were sighted on the refuge for the first time since 1990. Once a common nester on the refuge, lark bunting have not been known to nest here since 1988.

Baird's sparrows were sighted on two occasions in early summer. Singing males were detected along the Breeding Birds Survey (BBS) route that bisects the refuge and in DNC field 3 along the auto tour route.

Both of these neotropical migrants have shown declines on BBS routes throughout the western U.S. Baird's sparrow is a candidate 2 species in the U.S. and has already received threatened species status in Canada. Future plans for these birds as well as other nongame migratory birds include the establishment of a refuge monitoring program for our native grasslands.

8. Game Mammals

Pronghorn antelope were frequently observed in native grasslands along the Bootlegger Trail.

White-tailed deer sightings were most common in the vicinity of Unit I and II marshes. Sightings typically were of lone individuals, although 13 were sighted in October. Mule deer sightings were uncommon but were occasionally seen along the breaks country on the south boundary of the refuge.

10. Other Resident Wildlife

Resident gamebirds found on the refuge include ring-necked pheasant, gray partridge and sharp-tailed grouse. Formal surveys to census these species are not conducted.

Incidental observations indicated a poor nest/hatch year for all upland gamebirds. Pheasant and partridge broods are normally encountered, even in poor years, around the headquarters but only a few were seen this year. The cool, wet spring and summer weather was judged unfavorable for chick survival.

The sharp-tailed grouse dancing ground located along the auto tour route was active for the sixth consecutive year. The number of displaying males has increased from eight birds in 1988 to at least 40 in 1993.

A second ground located along the west boundary had six males displaying in early April. This ground was first detected in 1990 but the number of birds has always been about a half dozen.

15. Animal Control

The refuge is authorized to use lethal control for striped skunk and raccoon management. The plan authorizes predator control if duck nest success is less than 60% Mayfield in each of the refuge upland habitat types. Once nesting success exceeds 60% control will be terminated and not resume until success is less than 60%.

Trapping began on March 9th and continued through June 28th. Removal methods included kill trapping with model 220 conibear traps in wooden cubby box sets and live trapping with cages. Live trapped animals were destroyed by shooting or euthanized with drugs administered with a jab-pole/syringe. Traps were inspected daily and all non-target animals in live traps released. Surprisingly very few animals were captured. No skunks were caught compared to 23 last year and only 3 raccoons compared to 6 in 1992. Table VIII includes the number of animals captured, the month and number of trap nights.

Gray partridge "overwintered" well but cold wet weather during late spring and early summer was not conducive to nest hatching to chick survival.

SJM 02/93

TABLE VIII

NUMBER OF SKUNKS AND RACCOONS TRAPPED, MONTH AND TRAPNIGHTS AT BENTON LAKE NWR, 1993

Month	No.Skunks	No. Raccoons	Trapnights
March	0	1	713
April	0	1	1194
May	0	0	1437
June	0	1	1311
TOTAL	0	3	4655

The low numbers of skunks and raccoons trapped indicates a low relative abundance for both species. This low abundance is believed responsible for this year's high upland nesting duck success of 64% (See G.3).

16. Marking and Banding

Mallard preseason banding began on July 29th and continued until September 24th. The number of mallards banded during the last five years are shown in Table IX.

TABLE IX

MALLARDS BANDED AT BENTON LAKE NWR, 1989-93

Year	AHY-M	AHY-F	HY-M	HY-F	Total
1993	491	211	357	224	1283
1992	329	172	257	192	950
1991	160	48	54	17	279
1990	403	160	322	174	1059
1989	85	171	81	90	427
TOTAL	1468	762	1071	697	3998

Other ducks banded this year included 668 blue/cinn. teal, 592 northern pintail, 101 redhead, 6 gadwall and 1 American wigeon.

---

17. Disease Prevention and Control

Avian botulism which occurs nearly every year during late summer was not evident this year (Table X). Bi-weekly airboat patrols in late July and August didn't detect any dead birds with the exception of Franklin's gull chicks in Units IVc and VI. Cool wet weather was believed responsible for the gull mortality and the absence of botulism.

Northern pintails provided the bulk of this day's banding catch. Nearly 600 pintails were banded - an all-time high for the refuge.

RFJ 09/93

A grain elevator exchange with DeSoto Refuge provided 500 bushels of corn for refuge preseason duck banding.

RFJ 03/93

TABLE X

BOTULISM LOSSES AT BENTON LAKE NWR, 1989-1993

Year	Number of Dead Birds
1993	0
1992	58
1991	3738
1990	509
1989	2025

H. PUBLIC USE

1. General

Public use on Benton Lake National Wildlife Refuge is principally wildlife oriented. Public use visits to the refuge this year were estimated at 9300. Wildlife observation, wildlife photography, environmental education and waterfowl hunting are the main activities.

2. Outdoor Classrooms-Students

The refuge annually hosts The Great Falls Public School Environmental Education Program. The program is taught by elementary teachers and includes elements on water, plants, soils and wildlife. Approximately 2200 third and seventh graders visited the refuge during May and October respectively.

3. Outdoor Classrooms-Teachers

The refuge hosted a "Wet and Wild" workshop for 15 teachers during July. The refuge was a field trip site for the two day program developed by Northern Montana College and the refuge staff. The workshop combined the WET (Wetland Education for Teachers) and WILD (Environmental Education) programs. The field trip day included presentations by the refuge and Partner's For Wildlife (PFW) staff on wetland ecology, PFW in Montana, contaminants at Benton Lake and a tour of the refuge.

5. Interpretive Tour Routes

The refuge self-guided auto tour route was heavily used during the period April-September with visitations ranging from 600 to 916 per month.

6. Interpretive Exhibits/Demonstrations

Benton Lake again coordinated a "Montana Refuges" exhibit and information booth at the Montana State Fair in Great Falls. Refuge personnel from the seven Montana NWR's staffed the booth from July 31st through August 7th. The exhibit was housed in the "Natures Den" along with the Montana Department of Fish, Wildlife and Parks, National Park Service, Bureau of Land Management and the U.S. Forest Service. Visits to the exhibits were estimated at 18,000. The Interagency display was awarded the Best Educational Exhibit for 1993.

Boy Scouts on their refuge visit examined duck nests and great horned owl pellets in the refuge shelterbelt.

SJM 06/93

Various tours and other programs conducted by refuge staff during 1993 are shown below.

Program/Service	Group	Staff
Judging	-Great Falls Science Fair	Johnson
Refuge talks	-Conrad Garden Club	Miwa
	-Great Falls Sierra Club	Gilbert, Johnson
	-Great Falls Exchange	Martin
	-Conrad Wildlifers	Martin
	-MSU Wildlife Students	Martin
	-Cent Flyway Tech Council	Martin, McCollum, Johnson, Stutzman

8. Hunting

Hunting on the refuge opened with the State waterfowl season on October 2nd. Opening day an estimated 120 hunter visits were recorded compared to 40 last year. Opening weekend hunters bagged an average of 2 ducks/hunter. One-hundred and nine ducks checked included 40% mallard, 30% gadwall, 8% northern shoveler, 6% northern pintail and a few teal spp., redhead, lesser scaup and ruddy ducks.

Fewer ducks were bagged/hunter for the remainder of the first season which closed on October 17th. The season re-opened on November 2nd-28th and re-opened again from December 18th until January 2nd, although the refuge closed for the season on November 28th. Hunter visits and harvest during the late split seasons was low because the marshes were frozen for much of the period. Traffic counters indicated approximately 1100 hunter visits from the 2nd until the 17th.

Upland gamebird hunters, as usual, shot very few birds since the best pheasant, sharp-tailed grouse and gray partridge habitat is in the areas closed to hunting.

11. Wildlife Observation

Each spring a portable blind that will accommodate three persons is placed near a "lek" where male sharp-tailed grouse conduct their annual spring courtship dances (See G.10). This spring the blind was reserved on 37 mornings in April and May compared to 42 mornings last year.

17. Law Enforcement

Law enforcement is conducted mainly during the hunting seasons, during easement compliance work (see Wetland District narrative) and as needed during the remainder of the year.

Although hunting activity on the refuge increased significantly from last year only two NOVs were written this year. These included two for hunting waterfowl during a closed season. This compares to two and seven cases in 1992 and 1991 respectively.

Martin assisted the Montana Highway Patrol with a rollover accident investigation that occurred on the auto tour route on the April 10th. A lone male occupant claimed to have swerved to avoid a porcupine that was crossing the road. The occupant then left his vehicle, with an unopened bottle of vodka, and started to walk 12 miles to Great Falls. During the next four hours the

individual claimed he drank the vodka, apparently to celebrate his misfortune, and hitchhiked to the closest saloon where he had several beers before calling the sheriff. The man was charged with DWI but vowed to fight it out in court. The eventual outcome of the case is not known.

I. EQUIPMENT AND FACILITIES

This year was another active year for maintenance and rehabilitation of refuge facilities and equipment. However, the exceptionally wet summer had a negative affect on several projects including delays or complete postponement of some jobs.

1. New Construction

A new concrete block **seed storage building** was built during late summer to replace an old truck van box that had been used for seed storage. The van box had become inadequate for storing the volume of grass and legume seed that the refuge is handling now for the Partners for Wildlife program and for reseeding DNC and cropland on WPAs and the refuge. The building is about 14 by 22 feet in size with concrete block walls on a concrete foundation. Our goal of having a sturdy mouse-proof building was accomplished very well by a very careful and skillful refuge crew.

2. Rehabilitation

Maintenance Management System funds were available for several other projects this year. Several minor jobs were accomplished to bring the refuge office, shops, and public use facilities up to new federal accessibility standards. This included marking handicapped parking, modifying office and shop entryways, and making changes in the refuge office restroom.

There were two projects at the **Muddy Creek Pump Station**. The **stop-log dam** was over ten years old and many of the boards had become warped and weak. New boards were cut, assembled and installed during the summer. Over the past two or three years, **Number One Pump** had developed a noticeable vibration. That pump was removed and reconditioned with new or rebuilt bearings. The motor was also torn down, inspected and cleaned with preventive maintenance work performed.

Two other major rehab projects were planned for late summer but the continuing summer rains caused postponement until 1994. **Unit 3** was drawn down in early July in anticipation of initiating a drainage system clean-out project. The purpose of the work was to improve intra-unit drainage to improve water management capabilities in the unit. Although most of the water in the unit was gone by late August repeated rain showers prevented the marsh bottom from drying sufficiently to permit the use of heavy equipment. The second postponed project was the planned reconstruction of the **Unit 4a Dike** and water control structure. The work was to be accomplished by Ducks Unlimited beginning in September. Saturated soil conditions also delayed that work until 1994.

3. Major Maintenance

There are several buildings which are known to have asbestos components so a refuge wide asbestos evaluation was conducted in December 1992. As of the end of 1993, no report had been received. There are no current plans for removal. Plans will be developed as soon as dangers are pinpointed.

A new concrete mouse-proof block seed storage building was designed and built by the refuge staff.
RFJ
10/93

EEO Vince Marko applying a coat of fiber sealer to bond the concrete blocks together.
RFJ
10/93

Refuge snow removal in January - something we haven't had to do for the past several years.
RFJ 01/93

REVIEW AND APPROVALS

BENTON LAKE WETLAND MANAGEMENT DISTRICT

Great Falls, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

James E McCollum 3/15/94

Project Leader Date

Associate Manager Review Date

Regional Office Approval Date

BENTON LAKE WETLAND MANAGEMENT DISTRICT

Great Falls, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

INTRODUCTION

The Benton Lake Wetland Management District (WMD) encompasses some 25,000 square miles of north central Montana, an area roughly the size of West Virginia, making it the largest WMD in the country (Figure 1). Established in 1975, the district is administered by the staff at Benton Lake National Wildlife Refuge and includes 21 waterfowl production areas (WPA's) totalling 14,626 acres. The WPA's range from 80 to 3,734 acres in size and are widely scattered across a ten county area (Figure 2). Fourteen WPA's are located over 100 miles from headquarters making effective management of these units somewhat challenging. Perpetual wetland easements are spread over 90,000 acres of private land in all ten counties, protecting some 7,088 acres of wetlands.

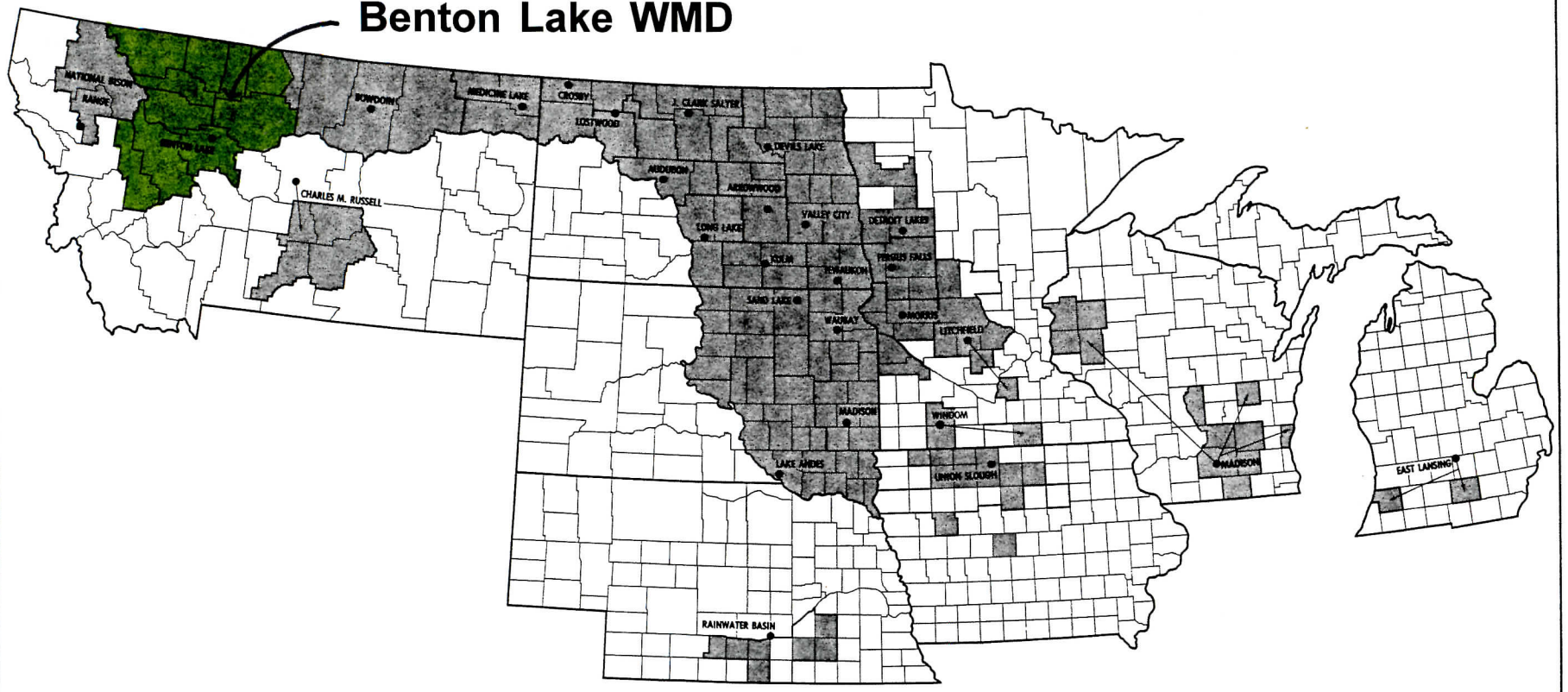
Topography, soils, climate and precipitation vary greatly across the WMD resulting in a significant diversity of habitat types. The western portion of the district is dominated by the Rocky Mountains and includes broad valleys interspersed with glaciated wetlands and riparian habitat. To the east lies the prairie pothole region of the northern Great Plains, an intensively farmed area with remnant tracts of short grass prairie and small isolated mountain ranges.

UNI ES
DEPARTMENT OF THE INTERIOR

WATERFOWL PRODUCTION AREAS

UN ES
FISH AND WILDLIFE SERVICE

Figure 1.



COMPILED IN THE DIVISION OF REALTY

WASHINGTON, D.C. SEPTEMBER 30, 1992

0 100 200 300 MILES

BENTON LAKE WETLAND MANAGEMENT DISTRICT

* Benton Lake National Wildlife Refuge

▪ Waterfowl Production Areas

1.	Furnell	1,995.00 Ac	
2.	Ehli	475.24 Ac	
3.	Danbrook	327.00 Ac	
4.	Dunk	80.00 Ac	
5.	Brown	260.00 Ac	
6.	Long Lake	645.66 Ac	
7.	Blackhurst	320.12 Ac	
8.	Cemetary	108.58 Ac	
9.	Peterson	94.20 Ac	
10.	Hingham Lake	280.00 Ac	*
11.	Jarina	640.00 Ac	
12.	Savik	397.00 Ac	
13.	Sands	378.93 Ac	
14.	Brumwell	251.50 Ac	
15.	Hartelius	307.22 Ac	
16.	Big Sag	349.58 Ac	**
17.	Kingsbury Lake	3,733.69 Ac	**
18.	Schrammeck Lake	420.24 Ac	
19.	Blackfoot	1,524.60 Ac	
20.	Kleinschmidt Lake	1,120.00 Ac	
21.	Arod Lakes	797.46 Ac	

TOTAL FEE ACREAGE 14,506.02 Ac

* Leased from the State of Montana
** These WPA's contain acreage held under BLM and State ownership

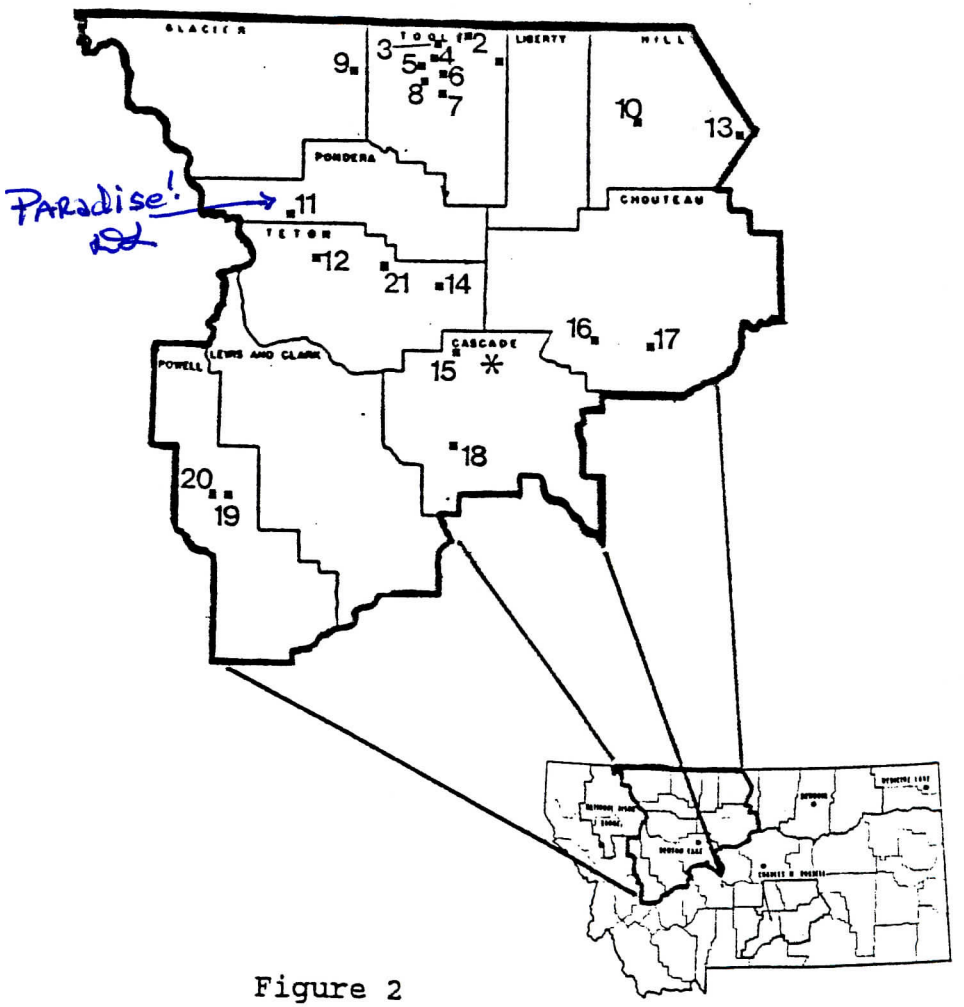


Figure 2

INTRODUCTION

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A. HIGHLIGHTS

Annual precipitation was much above normal throughout the WMD which resulted in excellent upland and wetland habitat conditions throughout the year (B and F.2).

Ducks Unlimited completed a project on the Ehli WPA in Toole County to restore or enhance over 200 wetland acres (F.2)

Two hundred fifty-eight (258) acres of dense nesting cover (DNC) was rejuvenated on six WPA's under the cooperative haying program (F.8).

Sixty-four acres of cropland were seeded to native grasses on the Blackfoot WPA in Powell County. All of the approximately 280 acres of cropland on the unit have now been seeded back to natives (F.5).

Two-hundred sixty-five acres of the newly purchased Arod Lakes WPA were seeded to dense nesting cover (F.5)

B. CLIMATIC CONDITIONS

The year began cold and wet. Significant spring runoff throughout the WMD resulted in excellent wetland conditions. The summer continued wet and cold with July the coldest and the third wettest on record for Great Falls. Above normal precipitation was received through November. December was warm and dry. Precipitation totals were up to eleven inches above normal in some parts of the WMD for the year.

Local weather conditions can vary greatly across the WMD. Precipitation totals from National Weather Service (NWS) reporting stations near WPA's can be found in Table I.

TABLE I

PRECIPITATION RECORDS FOR SELECTED NWS REPORTING STATIONS

County	(Station)	1993 Total	Normal	Percent of Normal
Cascade	(Cascade)	26.43	15.89	166%
Chouteau	(Geraldine)	24.20	15.55	156%
Glacier	(Cut Bank)	22.30	11.73	190%
Glacier	(E. Glacier)	28.64	28.23	101%
Hill	(Havre)	15.35	11.16	138%
Lewis-Clark	(Augusta)	24.27	13.08	186%
Liberty	(Chester)	15.21	11.48	132%
Pondera	(Valier)	19.55	11.97	163%
Powell	(Ovando)	14.78	13.45	110%
Teton	(Choteau)	16.02	10.54	152%
Toole	(Sunburst)	22.79	12.11	188%
Toole	(Gold Butte)	22.68	12.96	175%

C. LAND ACQUISITION

1. Fee Title

Acquisition of fee title lands in Montana is relatively easy when compared to the Dakotas. County Commissioner approval is not needed and the Governor has designated the Director of the Department of Fish, Wildlife and Parks as the appropriate official to approve purchases for the Waterfowl Production Area Program. Most Counties in the WMD are very supportive of the program. The Revenue Sharing Program is not a problem in Montana. In most cases, revenue sharing payments are substantially more than the tax payments on the property. A perfect example is an 1100 acre tract in Powell County that was purchased in 1992. Taxes on this tract were slightly more than $300 and the revenue sharing payment exceeded $2000.

One of the highlights of the acquisition program in 1993 was the purchase of a 120 acre roundout on the Ehli WPA in Toole County. This roundout gave us complete ownership of the main marsh on the unit. This marsh had been drained prior to the original purchase of the unit and restoration was impossible without owning the entire marsh. Repeated efforts had been made to acquire this roundout, but complicated ownership had prevented finalizing an agreement. Ducks Unlimited completed restoration of the marsh in December. Approximately 210 wetland acres were restored and enhanced.

Several meetings were held with a private landowner and MTFWP Region 2 personnel to discuss donating property for wildlife purposes. The 640 acre tract lies one mile south of the Blackfoot WPA, immediately adjacent to the Aunt Molly WMA and includes over 100 acres of wetlands.

Pat Carson, RO surveyor, surveyed the boundaries of the Arod Lakes WPA and portions of the boundary of the Kleinschmidt Lake WPA.

Approximately 48,000 acres have been delineated for fee purchase in the district. In addition, roundouts are needed for nearly half of the existing WPA's. Since 1975, some 12,403 acres have been acquired in eight counties. An additional 2,222 acres of Bureau of Land Management (BLM) and state lands are managed within the boundaries of three WPA's (Table II).

TABLE II

FEE TITLE ACREAGE BY COUNTY

County	Acquisition Goal	Number of WPA's	Total Acres
Toole	4,675	8	4,331.60
Chouteau	2,500	2	2,140.79*
Cascade	2,000	2	727.46
Hill	1,000	2	378.93**
Teton	2,251	3	1,445.96
Pondera	2,000	1	640.00
Powell	1,300	2	2,644.60
Glacier	2,096	1	94.20
Liberty	2,000	0	0
Lewis & Clark	500	0	0
Total	20,322	21	12,403.54

TOTAL MANAGED ACRES = 14,626.02

* An additional 1,942.48 acres of State and BLM lands are contained within WPA boundaries.

** An additional 280 acres are leased from the State of Montana (Hingham Lake WPA).

- -

2. Easements

Significant staff time was spent developing a conservation easement document that can be used in the valleys of western Montana for ecosystem/watershed protection and enhancement. The current wetland/grassland easement document does not adequately address the threats (i.e. subdivision) to these valleys. We learned that it is difficult to change old ways of doing business. The comfort level with our existing easement documents is very high and change comes very slowly. Numerous drafts of a new conservation easement have been submitted to the RO and several meetings have been held with RO staff to discuss the program. The landowner interest in conservation easements is very high and the potential for perpetual habitat protection is almost limitless. We need to act now because the threats that exist are continuing to grow and we are losing opportunities to protect habitat.

RO Surveyor, Pat Carson, setting up to shoot the boundaries of the Kleinschmidt Lake WPA in Powell County.
RFJ 09/93

We acquired a flowage easement from Gib Ehli that allowed us to restore the wetland on the Ehli WPA. Several acres of Mr. Ehli's land will be flooded when the marsh is at full pool. He is very pleased with the wetland restoration project.

Several of the largest and most important wetland complexes in the district (i.,e., the Highwood Bench and Brady/Teton River complexes) are not protected by Service easements. Unfortunately, we simply don't have the time or staff to inspect specific tracts and make the necessary contacts. Additional realty staff is needed in Montana, but we have been unsuccessful in our efforts to acquire additional help.

Wetland easements are scattered throughout all ten counties of the district, protecting 7,426 wetland acres on 136 tracts (Table III).

TABLE III

WETLAND EASEMENT ACRES BY COUNTY

County	Easement Tracts	Wetland Acres
Toole	56	2,933
Glacier	45	1,961
Liberty	9	428
Pondera	8	601
Hill	6	407
Cascade	4	78
Powell	4	700
Lewis & Clark	2	247
Teton	1	50
Chouteau	1	21
Totals	136	7,426

TABLE IV

GRASSLAND EASEMENT ACRES BY COUNTY

County	Easement Tracts	Grassland Acres
Powell	3	3,153
Glacier	1	1,557
Liberty	0	0
Pondera	0	0
Hill	0	0
Cascade	0	0
Toole	0	0
Lewis & Clark	0	0
Teton	0	0
Chouteau	0	0
Totals	4	4,710

3. Other

A meeting was held in Dillon in February with Harvey Wittmier and MTFWP representatives to discuss problems associated with the Arctic Grayling in the Big Hole River. The Grayling population in the Big Hole is the last remaining Fluvial Arctic Grayling population in the lower 48 states. Preliminary discussions involved the creation of a refuge, but it quickly became obvious that a refuge would simply not be feasible.

Grayling studies are continuing on the river and it appears that the Partners for Wildlife Program will play a significant role in any future efforts in grayling conservation in the Big Hole River.

D. **PLANNING**

2. Management Plans

Work continued on developing inventory and management plans for all WPA's in the WMD. Historical and management information for WPA's is currently very difficult to retrieve. Completion of management plans will allow easy access for information relating to past management activities on specific units.

4. Compliance with Environmental and Cultural Resource Mandates

Pesticide Use Proposals and the IPM were submitted to the RO. Johnson completed Pesticide Applicator Certification training.

5. Research and Investigations

Saline seep monitoring was not carried out in 1993 on the two WPA's with test wells. Seeps pose a serious threat to both public and private lands in Montana. These low volume springs form when native rangeland is converted to cropland in areas of the state where an impervious layer of shale lies beneath the soil profile. Fallow cropland, often referred to as recharge areas, does not effectively utilize annual precipitation resulting in excess water moving down through the soil profile. This water leaches out soluble salts and heavy metals which seep out on the ground surface down slope, often degrading water quality of wetlands and sterilizing topsoil.

Initial efforts to control saline seeps on two WPA's began in 1981 as a cooperative project between the Service and the Montana Salinity Control Association. A series of shallow cased wells were drilled on Brumwell and Long Lake WPA's for the purpose of monitoring sub-surface water tables. Wells are measured twice annually to track changes in the shallow ground water. Recharge areas which are owned by the Service have been reseeded to permanent vegetation (DNC) to utilize as much precipitation as possible. Unfortunately, the remaining recharge areas are located on adjacent private land where fallow cropping practices continue to aggravate seeps on adjacent WPA's.

The only long term solution to resolving saline seeps is to convert recharge areas (cropland) back to permanent vegetation. Changing land use on private lands adjacent to WPA's will be a major challenge in the coming years. A number of options to address the recharge areas need to be pursued including acquisition, grassland easements and other incentives which encourage cropland idling such as the Conservation Reserve Program (CRP).

The above normal precipitation received in 1993 has raised the water table in many areas. Seep development and formation may be accelerated as a result. Hopefully, we will be able to monitor these wells in 1994.

E. **ADMINISTRATION**

1. Personnel

The ten county district is administered by personnel at Benton Lake NWR. Effective management of the district is challenging, due to the small staff and logistical problems associated with managing WPA's located over 100 miles from headquarters.

For additional information on training, meetings and other personnel matters, refer to section E.1 of the refuge narrative report.

5. Funding

Operations and maintenance (1260) funds are shared between the refuge and WMD. Maintenance and development needs for the district were identified in the Annual Work Plan, Maintenance Management System (MMS) and the Refuge Operating Needs System (RONS). In addition, several "special project" proposals were submitted for the WMD involving watchable wildlife, wetland education and challenge grant initiatives.

6. Safety

There were no lost time accidents associated with district field work in 1993. Safety briefings are held before beginning all force account projects to assure the proper use of equipment and review any necessary safety precautions. For additional information regarding the station safety program refer to the refuge narrative report.

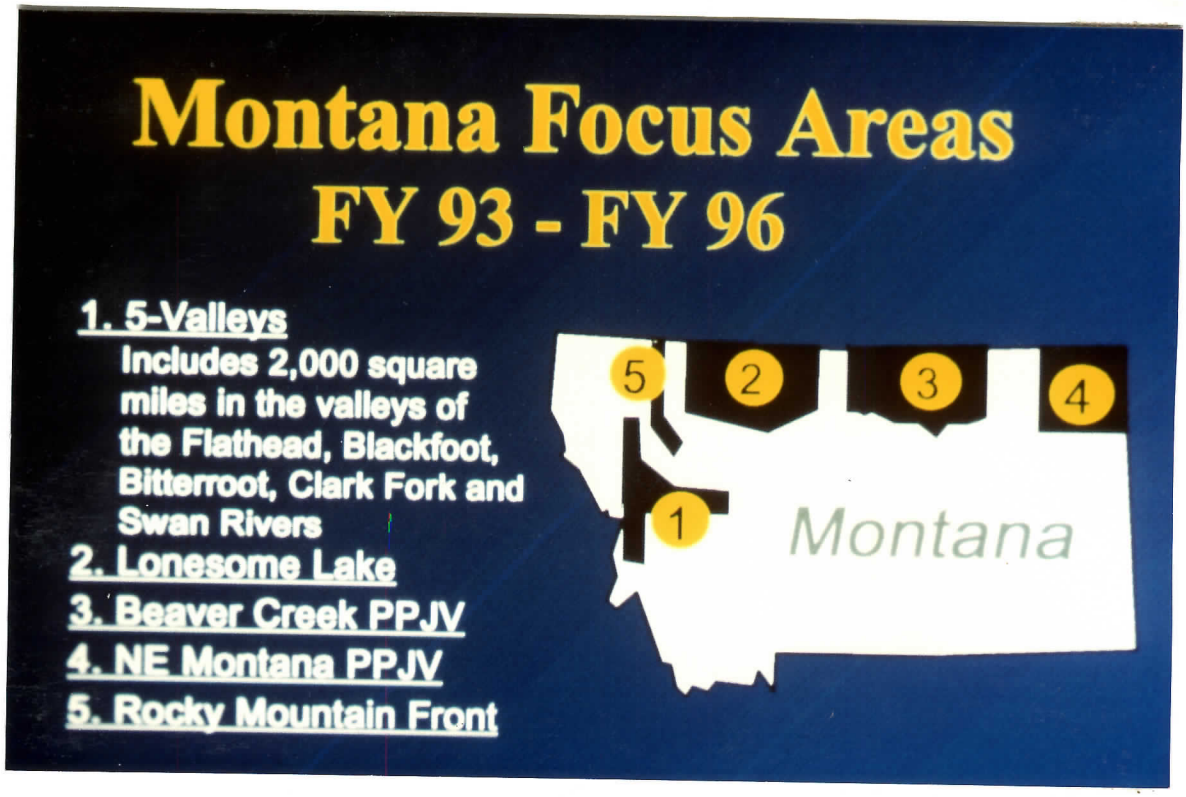
7. Technical Assistance

A positive relationship has developed over the past six years between the Montana Partner's for Wildlife (PFW) Program and Benton Lake WMD. This relationship was strengthened in 1993. Employees routinely interact to the mutual benefit of both programs. This interaction includes the sharing of ideas, objectives, equipment and staff time. We believe that an integrated approach to WMD management enhances the wildlife productivity of the entire wetland district.

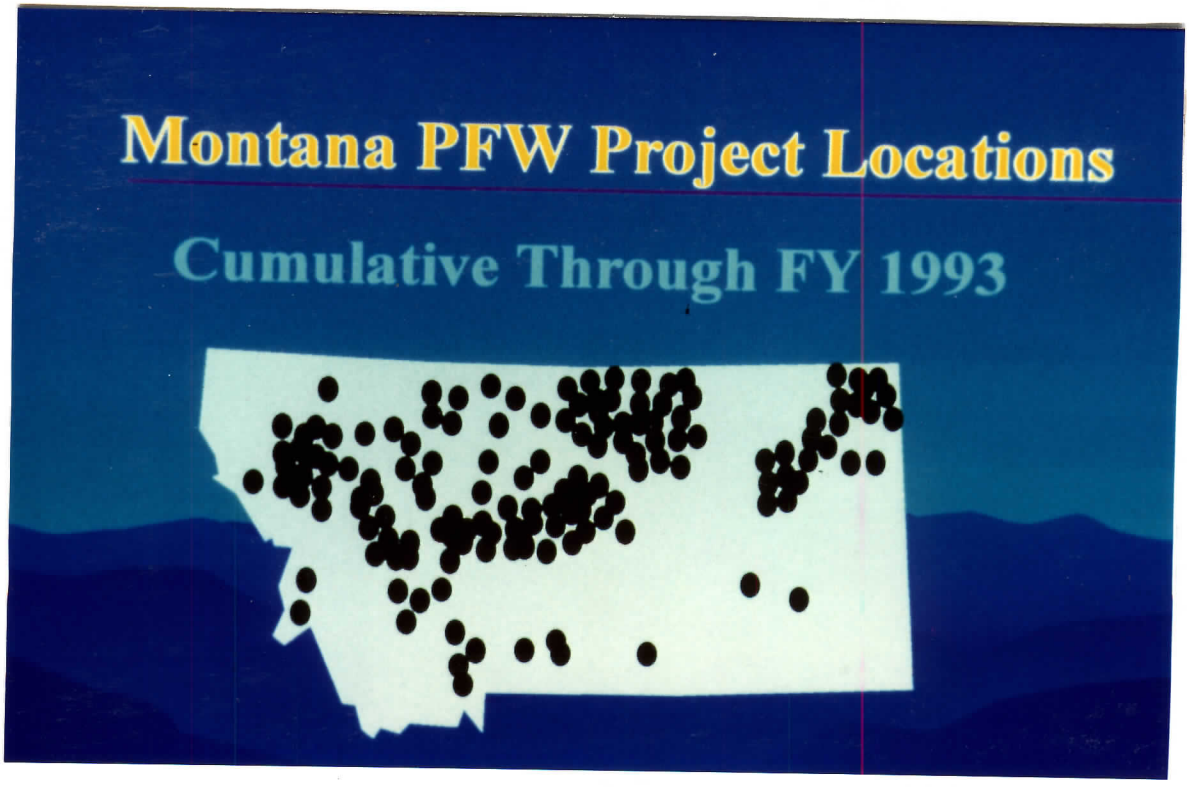
a. Administration

Montana's PFW Program is administered from Benton Lake NWR/WMD. Benton Lake provides office space for three PFW employees. The refuge also provides administrative support and comprehensive budget tracking assistance. In effect, this means that two programs are administered from one facility. This arrangement adds significantly to the administrative workload for the Refuge Assistant but means there is more money available for habitat projects.

Many expenses are shared. Partners for Wildlife provides funds for utilities, fuel, office supplies and other items. We also assist each other's operations on a day to day basis. In 1993 the PFW staff assisted the WMD with prescribed burning, banding and law enforcement. The WMD staff assisted PFW with landowner contacts, minimal effect determinations, and other PFW related activities.



The Montana Partners for Wildlife program has delineated several areas of the state as focus areas. These areas are located around National Wildlife Refuges or in Prairie Pothole Joint Venture areas.



The dots located on this picture depict some of the PFW projects located in Montana. Note how the dots conform with the focus areas above.

Landowners occasionally throw a wrench in the Partners for Wildlife Program.
SJM 01/93

I'll bet this way
OFF of Sally's truck!

Bob
Watch out for
the road apples!
JV.

Bob Johnson is pictured with a horse team that was used to skid trees from the woodlots to a sawmill where they were milled on two sides. The team was then used to skid the logs to the wetland site where they were used to construct the dam structure.
JWS 07/93

Rich-Mark Corporation is shown here setting the last section of the dam into place.
JWS 07/93

A pre-restoration view of the Geoff Foote wetland restoration project.
GAN 04/93

This 42 acre wetland was restored by means of a log, rock rip-rap structure with a fish ladder to allow fish migration through the system.
GAN 07/93

Poor agricultural practices have severely damaged spring creeks in the Blackfoot Valley. This photo depicts a before and after look at a stream restoration project in Powell County. On the right you'll notice the overgrazed stream that has been widened and is devoid of woody vegetation. On the left is the restored section. This section of the stream has been necked down to the original width, pools and overhead cover were restored, and a grazing management plan was developed and implemented.

GAN 06/93

This eight acre wetland in Toole County CRP was restored in 1989. Drought conditions kept this basin dry until the spring of 1993.
GAN 04/93

Fish friendly water control structures are an important tool used when restoring wetlands in perennial flowing streams. This five acre wetland was restored in conjunction with one mile of instream restoration.
GAN 04/93

A drained wetland in native prairie in Chouteau County prior to filling after a water control structure was installed.
GAN 09/91

This five acre wetland was restored by attaching a half round riser to an existing culvert on a driveway (Note the haystack in the background as a reference point). Total cost of the project was $250.
GAN 04/93

b. Private Lands Habitat Accomplishments

The Benton Lake WMD has three PFW Focus Areas. These areas are The Blackfoot River Valley, The Lonesome Lake PPJV, and the Rocky Mountain Front. Most of the PFW projects in the Benton Lake WMD are confined to established focus areas.

1. Wetland Habitat

Wetland restoration, enhancement and establishment remained a high priority in 1993. Table V summarizes the private land wetland accomplishments within the WMD in 1993. Landowner interest in wetland projects remains high throughout the district. This is particularly true of projects involving reservoirs and stockdams, however, we continue to restore natural wetlands. Three unique private land wetland projects from 1993 are highlighted below.

1a. McDermott Project - This project entailed wetland restoration/establishment in a tract of privately owned native prairie. Construction expense were cost-shared between Ducks Unlimited and PFW. The project resulted in five wetland restorations and one wetland establishment. Wetland acres restored and established totalled **105** acres. Total cost was $60,000.00.

1b. Foote Project - Meadow Springs Ranch is located in the Blackfoot River Valley. A **42 acre** spring-fed wetland was drained for hay and crop production in the 1940's. The basin was also modified by an antiquated irrigation system. This basin was restored in 1993. Construction costs of $20,000 were split between PFW, Soil Conservation Service,, MT Dept. of Fish, Wildlife and Parks, Ducks Unlimited and the landowner.

The landowners involved with this project, Geoff and Cathy Foote, have a strong land stewardship ethic. This commitment was recognized in 1993 when they received a National Wetland Conservation Award in the Individual Landowner Category. Only two of the Nation's landowners receive this prestigious award annually.

TABLE V

1993 PFW ACTIVITIES INVOLVING WETLAND HABITATS IN THE BENTON LAKE WMD

Project Type	Number of Basins	Acres Impacted	Total Cost
Wetland Restoration	26	402	$114,700
Wetland Establishment	25	172	$101,000
Wetland Enhancement	8	962	$ 51,000
TOTALS	59	1,536	**$266,700***

* Total Cost includes contributions by Non-FWS funding partners

2. Riparian and Fish Stream Habitats

Benton Lake WMD contains a vast acreage of riparian habitat. The WMD includes portions of the Rocky Mountain Front, Blackfoot Valley, and Missouri River Watershed. There are hundreds of miles of streams, creeks and rivers. Riparian areas are one of the most productive habitat types in the west. They provide habitat for fish, neotropic migrants, T/E species and a variety of wetland wildlife species. Unfortunately, riparian areas in Montana are often abused by grazing, haying and irrigation.

Clearly a comprehensive PFW Program should seek out opportunities to restore or enhance riparian areas and that has begun to occur in the Benton Lake WMD. Private landowners are showing greater interest in the restoration of these habitats. Table VI shows riparian habitat restoration accomplishment in 1993. Two riparian restorations from the Benton Lake WMD are also highlighted below.

2a. Monture Creek

Monture Creek is located in the Blackfoot River Valley. It has been identified by fishery biologists as the number one bull trout (a candidate T & E species) spawning tributary in the Blackfoot Watershed. Bull trout spawning habitat in Monture Creek has been degraded by heavy silt loads. Over-grazing is one factor contributing to siltation in Monture Creek. Partners for Wildlife, along with a number of other partners, participated in a private lands project that restored 5.1 miles of the creek. Activities included: fencing, pool development, streambank stabilization, and restoration of woody vegetation. A riparian buffer of 650 acres was also fenced to reduce excessive erosion.

2b. Chamberlain Creek

Chamberlain Creek is also located in the Blackfoot Valley. This tributary of the Blackfoot River has the highest densities of westslope cutthroat in the valley. Over 2 miles of Chamberlain Creek was restored in 1993 by constructing pools, re-planting woody cover, restoring natural meanders, and exposing gravel bars. Funding partners included: MDFWP, Trout Unlimited, National Fish and Wildlife Foundation and private landowners.

TABLE VI

1993 PFW ACTIVITIES INVOLVING RIPARIAN HABITATS IN THE BENTON LAKE WMD

Project Type	Number of Sites	Miles Restored	Total Cost
Riparian Restoration	3	5.1	$23,000
In-Stream Restoration	3	3.1	$74,500
TOTALS	6	8.2	$97,500*

* Total cost includes contributions by non-FWS funding partners

c. Funding Partnerships

Funding partnerships continued to flourish in 1993. Partnerships allow us to pool various sources of money for habitat work within the Benton Lake District. Money leveraging also allows us to participate in expensive or complex restoration projects. Most of the PFW projects completed in the WMD were cost-shared by agencies, conservation groups, or landowners.

It should be emphasized that partnerships develop in an atmosphere of trust and credibility. The reward is worth the effort but the process cannot be rushed. Table VII summarizes the amount of non-FWS monies contributed for habitat projects in 1993. Readers should note that over **$350,000.00 in non-FWS funds** were used on PFW projects in the Benton Lake District!

One of the most productive funding partnerships to develop in 1993 occurred with the National Fish and Wildlife Foundation. The Service collaborated with Trout Unlimited on a comprehensive grant request. The NFWF awarded $200,000 for work in the Blackfoot Valley. Over $400,000 in non-federal matching money was raised from MDFWP, TU, Orvis Corporation, Robert Redford Productions, Wildlife Forever, landowners and individual donations. This money will be used to restore riparian and wetland habitats and secure conservation easements.

TABLE VII

1993 PFW FUNDING PARTNERS - BENTON LAKE WMD

Group/Agency	$ Contributed
MT Department of Fish, Wildlife & Parks	$ 26,300
Ducks Unlimited	$ 59,000
Trout Unlimited	$ 53,000
Private Landowners	$145,000
Foundations & Grants	$ 41,500
US Department of Agriculture	$ 36,200
TOTAL FUNDS PROVIDED BY PARTNERS	$361,000

d. Other PFW Highlights

The Montana Partners for Wildlife Program received national exposure in 1993. Much of that exposure occurred because of projects in the Benton Lake WMD. In early May the Private Lands Staff from Washington visited Montana. The team spent a full day looking at projects in the Blackfoot Valley. We showed them how the Service can successfully integrate **all** programs into a comprehensive watershed protection strategy. The folks from Washington were evidently impressed because three staff members from Benton Lake were invited back to Washington to brief Director Beattie and conservation groups on the Blackfoot Initiative.

We traveled to Washington in June where we spent 2 hours with the Director talking about Partners for Wildlife, the Blackfoot and Benton Lake WMD. It was the Director's first briefing on the PFW Program. We emphasized that the Blackfoot Project integrates PFW, Small Wetlands Acquisition, easements, and WPA management into a comprehensive watershed management strategy. She asked a number of excellent questions. She was also pleased that we were restoring riparian and in-stream habitats.

Many good things came out of the Washington meeting. Director Beattie selected the Blackfoot Project as a recipient for a $150,000 Director's Award in FY94. Those funds will be leveraged to allow us to complete additional habitat work in the Valley. She also expressed an interest in visiting the Blackfoot and a tour is scheduled for the spring of 1994.

Additional dignitaries visiting the Benton Lake WMD and Blackfoot Valley project in 1993 included Assistant Director Dave Olson, Lori Williams, who is Minority Council for the Senate Environment Committee, the Executive Director of Trout Unlimited and representatives from the National Fish and Wildlife Foundation.

e. Conservation Provisions of the Food Security Act (FSA)

Numerous staff days were again spent working with the Soil Conservation Service (SCS) and Agricultural Stabilization and Conservation Service (ASCS) on various FSA wetland issues. Technical assistance was provided to SCS on nine minimal effect determinations.

Assistance was provided to SCS staff in Meagher County to investigate a possible converted wetland. After interviewing several individuals, examining numerous historical photos and reviewing site data that was provided by the SCS area engineer it was determined that the area in question was not a natural wetland, but had been created by leakage from an irrigation canal located upslope from the site.

Additional technical assistance was provided to the Glacier County DC concerning the placement of pits in wetlands. We also helped the Meagher County DC develop a handout on proper techniques for installing fiber optic cables through wetlands.

Four potential waterbank tracts were inspected and we attended ASCS Conservation Group Meetings in three counties. At the Cascade County meeting a proposal to allow ACP cost sharing for biological (insects) weed control was developed and submitted through channels.

f. Farmer's Home Administration (FmHA)

Seven additional Farmers Home Administration (FmHA) inventory properties were inspected this year for possible conservation easement opportunities. One conservation easement was proposed and is currently proceeding through the system while three more are pending. One FmHA conservation easement has been recorded in the district. The 12 acre tract provides floodplain protection for a tributary of Muddy Creek in Teton County.

g. Conservation Reserve Program (CRP)

The Conservation Reserve Program has removed more than three million highly erodible cropland acres from production in Montana. The benefits that CRP has provided to wildlife are extraordinary. These benefits are not simply to pheasants and other game birds. Numerous species of songbirds have also benefitted. Research at the Northern Prairie Wildlife Research Center has found that the two most common species in surveyed CRP fields were the Lark Bunting and Grasshopper Sparrow. These two species had shown a 50 percent reduction in population during the past quarter-century. Numerous other species had shown significant population increases in CRP fields. Cover establishment has reduced soil loss from highly erodible land an estimated average of 23 tons per acre per year in the Great Plains states. Water Quality benefits are also significant. In the Northern Plains estimates are that total suspended sediment was reduced by 33,980,000 tons or 11 percent, nitrogen by 123 million tons or 14.4 percent and phosphorus by 25.2 million tons or 13.3 percent.

CRP contracts will begin to expire in 1996. The future of CRP will be determined by the 1995 Farm Bill. At the present time the future of CRP does not look very bright. The major concern is with the cost of the program. Many people feel it is just too expensive although economic analysis of farm program payments in Colorado, Kansas, Nebraska, Montana, South Dakota and North Dakota in 1991 indicates that costs with CRP were more than 140 million less than farm program payments without CRP.

In April we held a meeting in Great Falls with 20 groups representing government, the ag community and the environmental community to try and develop a position statement dealing with the future of CRP. This process is ongoing. We developed a briefing statement for the Montana Congressional staff and we have attended several meetings with Congressional staff to discuss what we can do and to keep current on what is happening in Washington.

The CRP is not perfect. Changes can certainly be made that would improve the program. It is our hope that CRP will be maintained in some form, especially in the Northern Great Plains. We intend to be pro-active and do whatever we can to influence CRP policy in the 1995 Farm Bill.

8. Other Items

Revenue sharing checks for FY 1992 totalled $13,239 or 81.1% of full entitlement, a 9.4% decrease from last year. Payments less than 100% entitlement still far exceed personal property taxes paid by private landowners in the state. Consequently, county commissioners in the district are generally supportive of our small wetlands program. Due to lack of time, checks for all but one county were mailed rather than personally delivered.

F. HABITAT MANAGEMENT

1. General

The goal of habitat manipulation on WPA's is to protect and enhance wetlands and maintain maximum productivity in both native and tame grasslands. Haying, grazing and burning are the primary management tools used in the Benton Lake WMD. WPA habitat types include approximately 3,691 acres of wetlands, 7,384 acres of native grassland, 2,979 acres of tame grasses/legumes, 220 acres of forest, 68 acres of riparian habitat and 289 acres of cropland. Most of the cropland acres are located on the Arod Lakes WPA and will be seeded back to DNC in the spring of 1994.

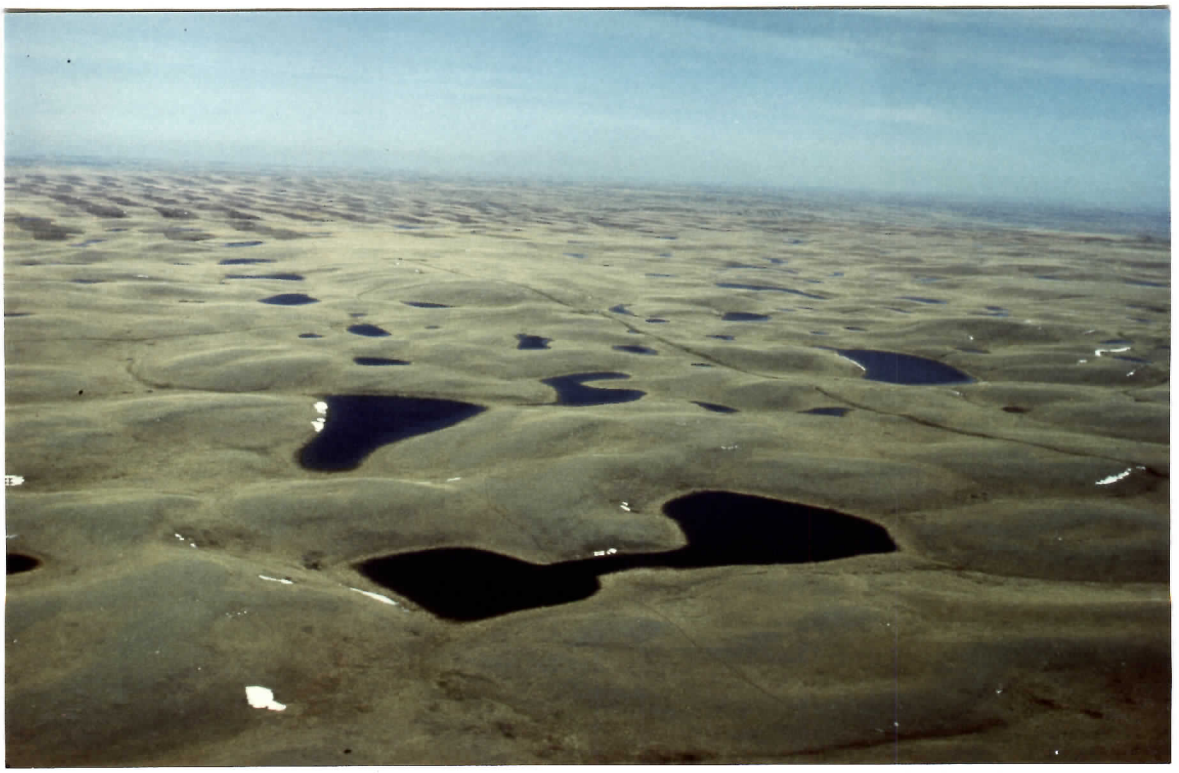
2. Wetlands

After several years of very poor wetland conditions throughout the WMD, 1993 brought a welcome change. Significant snowfall was received throughout the WMD and runoff filled most wetland basins in the spring. Several large DU projects filled up and were used extensively by breeding waterfowl. Heavy rains throughout the summer maintained water levels in most wetlands.

The completion of the Ehli WPA wetland restoration project by Ducks Unlimited was the highlight of the year. This unit is located on the Canadian border in an area with an excellent wetland complex. Few semi-permanent marshes can be found in this area and secure brood water is lacking. Completion of this project has provided more than 40 acres of water three feet or deeper. Another 160 acres of shallower water has also been provided. We anticipate exceptional production from this unit in the future.

Bio-tech Gilbert and Co-op student Miwa removing old fence on the Blackfoot WPA in Powell County.
RFJ 06/93

Sodbusting in Glacier County. The conversion of native prairie to cropland has not stopped in Montana.
GAN 04/93



Wetland complex in Toole County in the spring of 1993 after excellent runoff.
TJT 04/93

The Blackfoot WPA continues to be the "jewel" of the WMD. The wetlands that were restored by DU in 1990 have seen increased vegetative growth and bird use. The artesian springs on the unit provide a reliable source of water which reduces our dependence on runoff. We hope to install water control structures in two dikes and a diversion structure to give us drawdown capability and enable us to provide water to two small wetlands on the unit.

Halfway Lake on the Sands WPA in Hill County continues to develop into an excellent marsh. Submergent and emergent vegetation have responded very well to the increased water levels in the unit. The interspersion of vegetation and open water is optimal and the level of bird use is very high.

We received a letter from the Federal Aviation Administration (FAA) in early May which outlined a plan to install a water control device that would allow Halfway Lake to be drained. There has been an ongoing debate with FAA concerning bird strikes at the Havre airport which is located immediately adjacent to Halfway Lake. FAA maintains that waterfowl from Halfway Lake are a serious hazard to aircraft operations and we disagree. A response was sent to FAA outlining our concerns with proposed activities that would negatively impact the WPA. We have not received a response from FAA. We attended a pre-construction meeting in early July to discuss runway rehabilitation work at the Havre airport. The bird strike issue was not brought up and no mention was made of draining Halfway Lake. We will certainly cooperate with the FAA and the airport board to do whatever we can to minimize any bird strike hazards. However, draining the marsh and eliminating Halfway Lake are simply not acceptable options.

A memo was sent to the RO prioritizing National Wetland Inventory needs in the WMD. Most of the district has not been mapped and we hope that the process can be speeded up a bit.

Water conditions at freeze-up were good throughout the WMD. Many marshes that are normally dry by mid-summer were still holding water.

3. Forests

The Blackfoot WPA is the only WPA in the WMD with forested habitat. Two hundred and twenty acres of Ponderosa pine on Marcum mountain and 68 acres of riparian habitat (cottonwoods, aspen, willow) along the Blackfoot river are found on this unit. No active management has been conducted in these forested areas. Our goal is to protect them from grazing and logging activities conducted on adjacent private land. The riparian area that was fenced on this unit in 1992 has started to recover nicely. Red-osier dogwood, which is common in the riparian zone, had been especially hard hit by cattle. Extensive growth of this species was noted in 1993. The grasses in the riparian area were also much more vigorous in 1993. Lush grass was present in the riparian zone just prior to freeze-up unlike previous years when the area had been heavily grazed all year and no new growth was present at freeze-up.

4. Croplands

Two-hundred sixty-five acres were farmed on the Arod Lakes WPA in 1993. This acreage is scheduled for seeding back to DNC in the spring of 1994. Approximately 60 acres of cropland were included in the 120 acre Ehli WPA roundout that was purchased in 1993. These acres had been planted to spring wheat when we purchased the tract.

5. Grasslands

Sixty-one acres on the Blackfoot WPA were seeded in October to a mix of basin wildrye (1.4 lbs.

Permittee Todd Zimbleman harvesting tall and intermediate wheatgrass seed on the Hartelius WPA in Cascade County.
RFJ 10/93

Alfalfa response the first spring after haying on the Hartelius WPA.
RFJ 05/93

PLS/acre), bluebunch wheatgrass (3.25 lbs. PLS/acre), thickspike wheatgrass (2.1 lbs. PLS/acre), slender wheatgrass (2.5 lbs. PLS/acre), and western wheatgrass (.9 lbs. PLS/acre). This seeding completes the conversion of more than 280 acres of cropland on the unit to native grasses. We experienced some successes and some failures with the native seedings on this unit. Cheatgrass (Downy brome) has been a major headache and we still have some problem areas that we will have to deal with. We also found that spring seedings in the Blackfoot Valley are not the way to go. The dormant seedings that we completed in October met with far more success. These eliminated the problems with wet ground that are encountered in the spring. It's very difficult to seed early in the spring in the valley due to wet conditions. By the time you can get into the fields (early June), it's too late to get a good catch with the cool season natives that we seeded on the unit.

A total of 265 acres of cropland were seeded on the Arod Lakes WPA in Teton County. A standard DNC mix was used on this unit with Tall Wheatgrass (4.9 lbs. bulk/acre), Intermediate or Pubescent Wheatgrass (5.8 lbs. bulk/acre), Creeping Alfalfa, (3 lbs. bulk/acre) and Yellow blossom Sweetclover (.5 lbs. bulk/acre).

Two old waterbank tracts on the Danbrook and Dunk WPA's in Toole County were interseeded with a standard DNC mix in early May. Both of these tracts were in very poor condition in very poor soils. We felt that if we could get a reasonable catch with interseeding instead of breaking them out and starting over we could avoid all of the problems that go along with attempting to establish grassland on very poor quality soils.

Tame grass seed (Tall, Intermediate, and Pubescent wheatgrass) was harvested by a cooperator on the Hartelius and Brumwell WPA's in Cascade and Teton Counties. The Service share is 40 percent of cleaned and bagged seed delivered to the refuge.

The WMD includes 6,450 acres of native grassland. Most of this lies in the eastern portion of the district and consists mainly of western wheatgrass and green needlegrass. WPA's in the foothills and mountainous areas contain primarily western wheatgrass, bluebunch wheatgrass, and rough fescue. Grasslands are monitored and management activities are prescribed when vigor declines and species composition begins to deteriorate.

6. Other Habitats

One thousand Wood's Rose seedlings were planted on an island in one of the restored wetlands on the Blackfoot WPA in late April. All of the seedlings were planted in just over four hours by eight staff members. The 500 rose seedlings that were planted on the island in 1992 were thriving. The use of a power auger to dig holes certainly saves a lot of wear and tear on the old back. It also allows the planting process to proceed very rapidly. We did not have to water the shrubs this year due to the above normal amounts of precipitation that were received in the area.

8. Haying

DNC rejuvenation continued with 258 acres on six WPA's hayed in 1993 (Table VIII). Haying was not permitted before July 15 in order to protect ground nesting birds. Cooperators were required to rake or harrow the hayed areas to remove matted litter from the fields. Raking is not a common practice in this part of Montana and it is often extremely difficult to find a cooperator that has access to a rake. Cooperators provided us with checks made out to a local seed company for alfalfa purchase as payment for the hay.

TABLE VIII

1993 COOPERATIVE HAYING PROGRAM

WPA	Acres Hayed
Blackhurst	70
Ehli	68
Kingsbury Lake	58
Peterson	25
Jarina	25
Danbrook	12
Total	258

DNC rejuvenation through haying is preferable to breaking the stand out and starting over. The drought conditions that we have experienced in the past few years make grassland establishment a high risk operation. Failed seedings require another farming cycle for weed control and add additional cost to a very expensive procedure. In addition, stands that are broken out will not provide cover for at least three years.

9. Fire Management

No prescribed burns were conducted in the WMD in 1993. We were also fortunate to escape any wildfires.

10. Pest Control

Canada thistle, musk thistle, spotted knapweed, diffuse knapweed, Russian knapweed, small whitetop, leafy spurge and yellow toadflax are the targets of our weed control efforts. Mechanical, biological and chemical control methods are used. Fortunately, most infestations are small.

In 1993, 6.5 acres of Canada and musk thistle on two WPA's were sprayed with Curtail (Clopyralid) at a rate of one to two quarts per acre. Forty acres of Canada and musk thistle were mowed on one WPA and 100 Canada thistle stem mining weevils, Ceutorhynchus litura, were released into thirty acres of Canada thistle on the Schrammeck Lake WPA. This was the same location where 100 Canada thistle seed head weevils, Larinus planus, were released in 1992.

Several small patches of yellow toadflax, leafy spurge and diffuse knapweed were found on the Blackfoot WPA. All of these small patches were sprayed with Tordon (Picloram) at a rate of one quart per acre. Approximately three acres of spotted knapweed in small patches were sprayed with Tordon at the rate of one pint per acre on the upper slopes of the Marcum mountain portion of the Blackfoot WPA. This area is important deer and elk wintering range. We are attempting to use biological control on a much wider infestation of spotted knapweed on the lower slopes of Marcum mountain. Two moths, Urophora affinis and Urophora quadrifasciata, that attack knapweed flowers are present on the unit. We made one release of a root weevil, Cyphocleonus achates in September. We hope to obtain additional insects for release on this unit and eventually we hope that these species will exert effective control on the spotted knapweed on the unit.

The start of what we hope will be effective biological control. These spotted knapweed root weevils, Cyphocleonus achates, were released on the Blackfoot WPA in Powell County.

GLS 09/93

11. Water Rights

Dave Schmidt, water rights specialist from the RO, inspected the Blackfoot and Ehli WPA's in September. Dave needed to inspect the Blackfoot WPA wetland restoration work in order to fill out A Notice of Completion of Permitted Water Development and A Notice of Completion of Change of Appropriation Water Right. The Ehli WPA inspection was in conjunction with completing an application to acquire additional water rights for the unit.

13. WPA Easement Monitoring

No new violations were found in the WMD in 1993. The dry conditions of the past several years have reduced the need for recreational scraper use. The wet conditions of the summer of 1993 may stimulate drainage activity. No drainage activity was noted on private lands, but this will probably also change in 1994.

Many excellent wetland complexes exist in the WMD and these would be prime candidates for easements. Unfortunately, we just haven't had the time to field inspect the tracts and make the necessary contacts.

Easement monitoring in the Benton Lake WMD can be a very challenging proposition. Easement tracts are scattered over 5,000 square miles and isolated 40 and 80 acre tracts are sometimes difficult to find from the air since many remote areas don't have discernable section lines or other surface features.

G. **WILDLIFE**

Specific information on district wildlife populations is limited, due to its size and our limited staffing. Wildlife surveys are usually done incidental to other WPA projects. With an average driving distance of 100 miles from headquarters to most WPA's, collecting accurate and timely biological information is somewhat difficult.

1. Wildlife Diversity

The Benton Lake WMD stretches from the Rocky Mountains to the short grass prairie of the northern Great Plains. A wide diversity of wildlife habitat occurs in this 25,000 square mile portion of the state. Biodiversity on fee title land in the district is best represented by the varied habitat types of the Blackfoot WPA.

2. Endangered and Threatened Species

Montana includes habitat for six endangered species including four birds (the bald eagle, peregrine falcon, whooping crane and least tern) and two mammals (black-footed ferret and gray wolf). Threatened species within the state include the piping plover and grizzly bear.

Bald eagle populations continue to do well along several major rivers in the district. As many as 45 eagles have been sighted on the Blackfoot WPA which provides important migration and winter habitat. Seven active eagle nests have been documented in the Blackfoot River watershed including one located approximately 2 miles east of the WPA.

Grizzly bears are found in and along the front range of the Rocky Mountains. There have been three confirmed grizzly sightings on the Jarina WPA in Pondera County since the unit was purchased in 1986. Sightings have also been reported on the Savik WPA in Teton County.

Gray wolf sightings are becoming more common in the district. Wolves continue to move down along the front range out of Canada. Livestock depredation by wolves is a growing problem on the Blackfeet Indian Reservation in Glacier County. Sightings have been reported near Jarina WPA in the Birch Creek area.

3. Waterfowl

Waterfowl habitat is found in three distinct regions of the district. Most of the WPA's are located in the intensively farmed portion of Montana's Hi-Line referred to as the Golden Triangle. The Furnell WPA lies at a higher elevation in the Sweetgrass Hills along the Canadian border and is characterized by rolling glaciated prairie similar to the Coteau of North Dakota. The western portion of the district includes broad mountain valleys containing glaciated wetland complexes and extensive riparian habitat.

Estimating waterfowl production on widely scattered and diverse WPA's has proven to be difficult. No single technique can be extrapolated to the entire district due to differences in habitat types and predator populations. The only way to come up with an accurate production estimate for all WPA's would be to sample each habitat type within each of the three distinct regions of the district. In the past, production estimates have been "guesstimates" at best, based on partial pair counts and observations made incidental to other force account projects.

Nest dragging is the best alternative but getting an adequate sample size for all habitat types is nearly impossible due to our small staff, long distances to WPA's and the extensive amount of dragging done on the refuge. Nest searches were conducted on the Sands WPA in Hill County and the Schrammeck Lake WPA in Cascade County in 1993. Sixteen duck nests were found on the Sands WPA and nine hatched. Twenty-four nests were found on the Schrammeck Lake WPA and of the 18 we were able to relocate, eleven hatched. Excellent vegetative growth made relocating nests somewhat difficult on the Schrammeck Lake unit.

We received a call from the state warden in Augusta in late July concerning a crippled trumpeter swan that he had captured. We shipped the bird to the Raptor Rehabilitation Center at the University of Minnesota. The bird had been shot and had a broken wing. It was in such poor condition that it was euthanized. This bird was the female of a pair which had successfully raised cygnets in the past.

Thirty-seven trumpeters, including two collared birds, were seen on the Jarina WPA in Pondera County in October. Eleven of the birds were cygnets.

The Canada goose population continues to explode throughout the WMD. Installing nest structures for mallards is almost a futile effort since geese use the structures as soon as they are in place. We put a basket on the Hartelius WPA in Cascade County and hoped to entice a mallard hen to use it. Two days after it was installed a goose was sitting on it.

Mallard and pintail broods were seen on the Brumwell WPA in Teton County on 5/30. This unit was dry in 1992. As many as 30 duck broods were seen on the unit at one time in late June.

4. Marsh and Water Birds

A diversity of marsh and water birds are found throughout the district. Sightings on WPA's this year included sandhill cranes, eared grebes, American coots, black-crowned night herons, great blue herons, white pelicans, red-necked grebes and common loons.

Pied-billed, horned, eared and red-necked grebes have all been known to nest on WPA's in the district. At least three pairs of sandhill cranes successfully nested on the Blackfoot WPA this year. Crane nesting has also occurred on the Savik WPA in past years.

5. Shorebirds, Gulls, Terns and Allied Species

Excellent wetland conditions provided abundant habitat for shorebirds throughout the WMD in 1993. Species observed on WPA's included American avocets (*), marbled godwits (*), willets (*), common snipe (*), killdeer (*), Wilson's phalaropes (*) ring-billed gulls (*), long-billed curlews (*), black terns (*), short-billed dowitchers and common terns (*). Species listed above which have nested on WPA's are followed by an asterisk (*).

6. Raptors

Raptor's observed on WPA's during the year included golden eagles, bald eagles, prairie falcons, red-tailed hawks (*), Cooper's hawks, rough-legged hawks, American kestrels (*), ospreys, northern harriers (*), Swainson's hawks (*), great horned owls (*) and ferruginous hawks (*). Species listed above which have nested on WPA's are followed by an asterisk (*).

7. Other Migratory Birds

Two mourning dove routes were completed this year. A cooperator, Miles Matthews, completed the Oilmont route in Toole County. Three doves were heard and four seen. The Shonkin roue in Chouteau County was run by Bob Johnson. Twenty-two doves were heard and four were seen.

The Breeding Bird Survey for the Highwood route was completed this year by volunteer Karen Stutzman. This 25 mile loop is located 20 miles northeast of Great Falls and contains 50 stops.

More than 200 mountain bluebirds were seen on the Kleinschmidt Lake WPA in late September.

8. Game Mammals

Ten species of big game mammals occur in the district including white-tailed deer, mule deer, elk, black bear, grizzly bear, antelope, moose, mountain lion, bighorn sheep, and mountain goats. All but the latter three have been reported on WPA's. No specific WPA surveys are conducted for these species.

White-tail and mule deer populations continue to do well on most WPA's in the district. Both species have taken advantage of the extensive CRP acreage on private land.

Small herds of pronghorn antelope were regularly seen on Kingsbury Lake and Furnell WPA's during the year. Antelope are scattered throughout the eastern half of the district.

Elk have been observed on five WPA's in the past three years. The Blackfoot WPA provides some of the best elk winter range in the Blackfoot Valley. Seventy animals were seen in the

These Sandhill Crane colts were found on the Blackfoot WPA in Powell County in early May. At least three pairs of cranes nested on this unit.
RFJ
05/93

The Sands WPA in Hill County was the summer home of these young Northern Harriers.
RFJ
06/93

sagebrush flats on the west side of Highway 200 in late December. Up to 200 animals use the Marcum Mountain portion of the unit each year. Thirty-six cows and calves and one bull were seen on the Kleinschmidt Lake WPA in late September. Elk also use portions of the Jarina and Blackfoot WPA's for calving in the spring.

A large elk herd wintered on the Long Lake WPA in Toole County along with several hundred white-tailed deer. Many of these animals live year round on the open prairie. The Sweetgrass Hills herd continues to grow and these animals are occasionally seen on the Furnell WPA.

The large amount of CRP acreage in the WMD continues to provide excellent habitat for a wide array of resident and migratory species. A significant amount of CRP lies adjacent to the Long Lake WPA and is heavily used by the wintering elk and deer.

Black bears, bobcats, and an occasional moose have been reported on the Blackfoot WPA by private landowners in the area.

10. Other Resident Wildlife

The eastern half of the district lies in the heart of Montana's Golden Triangle. Much of this intensively farmed area lacks sufficient winter cover for many species. Seven species of upland game birds are found in the district including sharp-tailed grouse, gray partridge, ring-necked pheasants, ruffed grouse, blue grouse, spruce grouse and Merriam's wild turkeys. All but the latter have been observed on WPA's.

Relatively mild winters and additional habitat on CRP lands have resulted in increased populations of upland game birds in portions of the district during recent years. The extremely wet and cold summer of 1993 impacted upland bird production throughout the WMD. The effects were not uniform, however. Pheasant populations were severely impacted in some locations, yet at other locations twenty miles away populations were excellent with many young birds.

Gray partridge seem to have been hit hard throughout the area. Coveys were almost impossible to find and the coveys that were around were very small.

Sharp-tailed grouse were down again in the southern part of the WMD, but large numbers were seen in the Sweetgrass Hills area of Toole County during the big-game season.

Several blue grouse broods were seen on the Marcum mountain portion of the Blackfoot WPA and a ruffed grouse brood was seen in the riparian area near the Blackfoot river on the unit.

Coyotes, red fox, raccoon, badger, bobcats, striped skunks, mink, long-tailed weasel, muskrats, beaver, Columbian and Richardson's ground squirrels, prairie rattlesnakes and black-tailed prairie dogs are also found on WPA's in the district.

16. Marking and Banding

WMD staff assisted Montana Natural Heritage Program folks with their pelican banding efforts at Arod Lake in July. The breeding colonies are located on islands in the state owned portion of the lake which is just east of the WPA boundary. A total of 647 young pelicans were banded with standard FWS bands. It appears that the pelican colony at Arod Lake is thriving.

Montana Department of Fish, Wildlife and Parks employees banded ducks on the Sands WPA in Hill County. Swim-in traps were used on Halfway Lake with 226 birds captured. Species

Young pelicans at Arod Lake patiently waiting their turn to be banded.
RFJ 07/93

Volunteer Liz Nichol enjoying an up-close and personal experience with a friendly little pelican.
RFJ 07/93

Co-op student Miwa adding to her life list of species banded.
RFJ 07/93

banded included mallards (19), pintails (56), wigeon (9), gadwall (39), green-winged teal (35), and blue-winged teal (68).

H. **PUBLIC USE**

1. General

A variety of wildlife oriented recreation, including birdwatching, hiking, photography, hunting and trapping in accordance with state regulations takes place on Waterfowl Production Areas. The units are open year round for these activities. Travel on WPA's is limited to foot or horseback only and overnight camping and fires are prohibited on all units except the Arod Lakes unit in Teton County where camping and fires are allowed on a small campground that was in use when we purchased the unit.

Monitoring public use activities on WPA's is very difficult. The large size of the district and the remote location of many of the units precludes routine patrols to check public use activities. We rely heavily on adjacent landowners and hunters to provide us with information on public use. Trapping and hunting are the most common public use activities on WPA's in the WMD.

6. Interpretive Exhibits/Demonstrations

The interpretive overlook and parking area on the Blackfoot WPA continued to receive significant use during 1993. A traffic counter was installed on the unit in June and more than 800 visits had been recorded by the end of the year. Large numbers of spring migrants and many waterfowl broods attracted many birders. A sandhill crane nest was again visible from the overlook. Adult cranes with young were seen regularly feeding in the newly seeded native grass stands on the unit. The unit is located along highway 200 which is a heavily traveled main route between Missoula and Great Falls.

8. Hunting

In the eastern portion of the WMD upland game hunting accounts for most of the WPA visits during the fall season. Sharp-tailed grouse and gray partridge were hard to find on these units in 1993.

Hunting for ring-necked pheasants was excellent in the Great Falls and Ulm area and north into Teton and Pondera Counties. The newly acquired Arod Lakes WPA in Teton county provided some excellent pheasant hunting. The area received heavy use throughout the season. The 260 acres that had been seeded to DNC in the spring had excellent cover. Lots of birds were found on the unit after the pheasant season during a pheasant survey/dog training trip to the unit.

The Blackfoot WPA was heavily utilized by waterfowl hunters in 1993. Fifteen hunters were present on the unit on opening day. This was less than half the number that were present on the unit on opening day in 1992. A wide variety of species from buffleheads and goldeneyes to pintails were harvested.

The Kingsbury Lake unit in Choteau County provides mule deer and antelope hunting opportunities. Late in the big game season Brewer saw 45 doe and fawn mule deer and seven bucks on the unit. Antelope numbers in the area have been significantly reduced in the past several years as a result of a liberal harvest strategy that allows over the counter purchase of

doe/fawn antelope licenses. During the same hunting trip Brewer only saw a doe and two fawn antelope on the unit.

Schrammeck Lake, Blackfoot and Furnell WPA's also offer good hunting for mule and white-tailed deer. One of the landowners adjacent to the Schrammeck Lake unit closed all of his land to hunting this year in protest of the State Land Boards decision to allow hiking and birding on State School Lands. Many deer used his land and reduced the hunting opportunities on the WPA. The Furnell unit also offers excellent antelope hunting.

The Marcum mountain portion of the Blackfoot WPA is a popular site for late season elk hunting. This portion of the WPA is included in the 11,000 acre Marcum mountain walk-in area administered by the Montana Dept. of Fish, Wildlife and Parks.

The Sands WPA is the only unit in the WMD that is closed to hunting. Gordon Sands, who donated the unit to the Service, stipulated in the deed that hunting and trapping be prohibited.

No biological data relative to harvests is collected in the WMD. Most units are located a significant distance from headquarters and we simply don't have time to visit them on a regular basis.

9. Fishing

The Blackfoot WPA provides the only cold water fishing opportunities in the WMD. Several species of trout are found in the Blackfoot river which winds through one corner of the WPA. The upper reaches of the Blackfoot River are not highly rated as a trout fishery. Problems with mine tailings entering the river have seriously degraded water quality and significantly reduced fish populations in the past. The river has started to recover and fish populations have increased in the middle reaches of the river near the WPA.

Warm water fishing opportunities for northern pike and yellow perch can be found on the Arod Lakes WPA. Ice fishing on this unit is a very popular pastime and northerns up to twenty ponds have been caught in the main lake.

10. Trapping

Trapping of nine species of furbearers in the WMD including marten, otter, muskrat, fisher, mink, bobcat, lynx, wolverine and beaver are governed by state regulations. Trapping is restricted to Montana residents only. There are no restrictions on trapping predators such as coyotes, red fox, badger, weasels, and skunks.

Trapping interest in the WMD has been significantly reduced for the past several years due to low fur prices. Reports indicate that coyote prices may be somewhat higher this winter and that may stimulate some additional trapping pressure. Muskrat numbers increased in response to improved water levels, but rat prices are still depressed and we didn't see any muskrat trapping activity.

15. Off-Road Vehicling

Motorized vehicles are prohibited on WPA's, but unfortunately, some individuals never seem to get the message. Much of the off road use is associated with hunting from a vehicle or retrieval of big game. Enforcement is difficult, but additional fence construction and signing has reduced the problem.

We have a continuing problem with unauthorized vehicle access on the Furnell WPA. The Montana Power Company has several gas wells on the unit which they check on a fairly regular basis. Unfortunately, MPC employees often leave the gates open which allows hunters access to the unit.

17. Law Enforcement

Law Enforcement in a district the size of Benton Lake is difficult, at best. Travel time to many of the units is a four hour round trip. As a result, law enforcement patrols are usually conducted in conjunction with other WPA work projects.

Johnson, Brewer, and Marko assisted Special Agents Hanlon and Branzell with the execution of a search warrant dealing with an illegally killed grizzly bear in Teton County. The agents had received a tip concerning the bear and Marko and Brewer dug up the remains. The landowner was fined $5000 and was also ordered to pay $2000 in restitution.

Law enforcement efforts in the WMD began on September 5th with a trip to Toole County to check grouse hunters on the WPA's. Two old gentlemen were found hunting on the Furnell WPA. They had been hunting for two and a half days and had four grouse. Their dogs, which appeared to be older than they were, appeared to be just about spent. They were quite pleased with the current state of affairs and indicated that this hunting trip really had a dual purpose. They got away from their wives and did a little male bonding.

Johnson worked the Blackfoot WPA area on the opener of waterfowl season. Eleven vehicles and fifteen hunters were present on the unit. A wide variety of species from buffleheads to mallards were harvested. No violations were observed and everyone seemed to have an enjoyable hunt.

Johnson worked the Sweetgrass Hills area on the opening day of antelope season. Hunting pressure was very light and few animals were harvested.

Johnson and Sullivan assisted Montana State wardens with a check station at Geyser on Highway 87 on October 11, the second day of the antelope season. Twenty citations were written with a total of $6,000 in fines and twenty animals seized. Violations included no tag, transfer of tags, no evidence of sex or species, and failure to stop at a check station.

Sullivan and Johnson worked the Arod Lakes WPA area on the opening weekend of pheasant season. Hunting pressure was fairly heavy, but not as heavy as we had expected. Lots of birds were harvested and most hunters were quite pleased.

Johnson worked the opener of the big game season in the Blackfoot Valley. Pressure on the Blackfoot WPA was light as was pressure throughout the area. One vehicle was seen on a twenty mile trip through the Helena National Forest on the opening morning.

Johnson and Miwa assisted Montana State wardens with a check station at Kershaw, just south of Fort Benton on Highway 87 on 10/31. Eight animals were seized and ten citations written. Violations included no tag, transfer of tags, no evidence of sex or species and failure to stop at a check station. Montana wardens issue a $65 citation to any hunter that has game and fails to stop at a check station.

Sullivan and Johnson spent several days working the Missouri River in the Ulm and Cascade area. Thousands of geese were using the area and hunting pressure on some days was quite

EEO Marko and MW Brewer patiently waiting while the search warrant is served in the Yeager grizzly bear case in Teton County. Later in the day they dug up the remains of the bear.

RFJ 06/93

The outlet from the diversion structure that allows us to deliver water to the Sands WPA in Hill County had been severely eroded by high flows. The rock base was reshaped with the refuge backhoe and concrete was poured to stabilize the outlet.

RFJ 09/93

EEO Marko mowing the banks of the water delivery ditch into the Sands WPA in Hill County to prevent a tumbleweed buildup that greatly impedes water flow.

RFJ 08/93

heavy. We found evidence of lead shot use (shot wads), but we were unable to find any hunters with lead in their possession.

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

WMD staff poured 25 yards of concrete in the outflow area from our water control structure on Squaw Coulee that supplies water to the Sands WPA in Hill County. The area had washed out quite badly and the concrete was used to stabilize the rock spillway as part of an MMS project. The ditch that runs into the WPA at the end of the water delivery system was mowed to prevent a build up of tumbleweeds that impeded water flow each spring. Snowberry had built up along the ditch and was causing a major problem.

3. Major Maintenance

Approximately 1.5 miles of fence on the Kingsbury Lake WPA was repaired in May at the request of a WPA neighbor who planned to start a grazing program on her adjacent land. In November cattle were present on the WPA and we discovered that approximately one mile of fence on the western boundary adjacent to another landowner needs to be replaced. This replacement is scheduled for 1994.

Numerous breaks in the boundary fence on the Jarina WPA in Pondera County were repaired in October after more than 100 cattle were found on the unit. The WPA neighbor informed us that he was to busy to call and let us know that there was a fence problem. It appeared that elk and snow had caused the problem.

J. OTHER ITEMS

1. Cooperative Programs

a. Piedmont Swamp - Work continued with efforts to restore the Piedmont Swamp near Whitehall in Madison County. An MOU with the Golden Sunlight mine, MTFW&P, BLM, SCS and the Service that deals with managing the area was finalized. DU completed soil surveys and engineering design work that will create a 185 acre main pool in the marsh. The restoration work will cost more than $200,000 and we are having difficulty obtaining funding.

The Golden Sunlight mine purchased Piedmont Swamp two years ago and they want to restore the marsh for strictly wildlife purposes. The marsh was partially drained years ago and is presently cattail choked with very little open water. It is one of the largest natural marshes in western Montana.

b. The Lonesome Lake Prairie Wetland Project - A Prairie Pothole Joint Venture (PPJV) project that covers 3.3 million acres of private, state and federal lands in four counties. Initial efforts focused on a 16,000 acre Bureau of Reclamation core area that includes Lonesome Lake proper (1200 surface acres at full pool) and over 14,000 acres of native prairie. The core area is jointly managed by the Bureau of Reclamation (BR) and the Bureau of Land Management (BLM) for multiple use purposes.

Water conditions at the proposed Lonesome Lake NWR in Chouteau County were excellent in 1993.
GLS 09/93

A Memorandum of Understanding was developed in January to facilitate a cooperative effort between the BLM, Montana Department of Fish, Wildlife and Parks (MDFWP), BR and FWS to enhance the area for migratory birds. An interagency technical group was established to work on management plans for the Lonesome Lake core area. A topographic survey and hydrological investigation of the watershed were completed by Ducks Unlimited in May. Their work revealed that the 250 square mile drainage did not provide sufficient annual runoff to justify any cost effective cross-diking of Lonesome Lake.

Other proposed actions call for the elimination of annual crop production on 2,100 acres of BR cropland. These areas would be reseeded to native vegetation to provide additional cover for ground nesting birds. Major changes are also needed in the current grazing program which involves season-long livestock use. Modifying the farming and grazing programs to improve the area for wildlife has proven to be a political can of worms with the local agricultural community.

An environmental assessment (EA) was initiated by BR to evaluate several of the proposed actions. This resulted in public input from both conservation and agricultural interests. The National Wildlife Federation (NWF) passed a resolution calling for the establishment of a 16,000 acre National Wildlife Refuge. Local ranchers wrote members of the Montana congressional delegation asking them to scuttle the proposed "duck project".

A draft EA was completed by BR in October. The Service recommended that the joint BLM and BR jurisdiction be eliminated so that a single agency could provide a clear direction for the future management of Lonesome Lake. The designation of a refuge was not advocated by the Regional Office due to the current O&M funding crisis.

The disposition of the area remains up in the air at this time. The National Audubon Society recently joined NWF in calling for the establishment of a refuge. Both organizations made numerous contacts with our Washington Office and Assistant Secretary of Interior George Frampton resulting in a flurry of memos and briefing papers. The completed EA and additional public meetings are scheduled for early 1994.

c. The Blackfoot Challenge: A Watershed Initiative - This cooperative effort involves state and federal agencies, private landowners, businesses and conservation organizations working together on resource issues in the Blackfoot River Valley. The coalition, known as the Blackfoot Challenge, provides an organizational framework for participants to pool funding, resources and information to capitalize on opportunities and collectively resolve problems throughout the watershed.

Active participants in the group include nearly 100 private landowners, Montana Water Quality Bureau, North Powell County Conservation District, Plum Creek Timber Company, Big Blackfoot Chapter of Trout Unlimited, BLM, Forest Service, MDFWP, The Nature Conservancy, Montana Department of State Lands and FWS. The mission statement of the Challenge reads as follows:

"The Blackfoot Challenge is a forum that promotes cooperative resource management of the Blackfoot River, its tributaries and adjacent lands. Our mission is to coordinate efforts that will enhance, conserve and protect the natural resources and rural lifestyle of the Blackfoot River Valley for present and future generations. We support environmentally responsible resource stewardship through the cooperation of public and private interests."

The FWS role in the Challenge involves integrating the Partners For Wildlife (PFW) program with a new conservation easement initiative to protect and restore trust species habitat. Agricultural

Subdivision, even when it's called "Wildlife Farms", is a major threat to wildlife habitat in western Montana valleys. This tract is located west of Bozeman in the Gallatin valley.
RFJ 02/93

Many people want their little piece of "The Last Best Place" and as a result land prices have skyrocketed. This 40 acre parcel, just west of Lincoln in the Blackfoot Valley, was priced at $240,000.
GAN 07/93

Attendees at the Blackfoot Valley Noxious Weed and Riparian Management Tour held at the Blackfoot-Clearwater Game Range on September 27.

RFJ 09/93

lands in the Ovando portion of the Blackfoot Valley are threatened with residential subdivision and commercial development. Our new easement program was finalized near the end of the year and will help protect this unique area. Funding for the program is being provided by FWS "Duck Stamp" dollars, MDFWP 526 Wildlife Habitat Program and grant funding from the National Fish and Wildlife Foundation. Land and Water Conservation Funds (LWCF) will be needed to continue the easement program in future years.

Specific habitat accomplishments in the Blackfoot are covered under the Partners For Wildlife portion of this narrative (see Section E.7). Other joint FWS - Challenge activities include sponsoring a riparian management/weed control workshop for private landowners, pooling state and federal funding to complete wetland and riparian restoration projects and developing a biological weed control program.

d. The Rocky Mountain Front - The Nature Conservancy and Montana Department of Fish, Wildlife and Parks hosted a meeting in April to discuss the possibility of developing a conservation strategy for the entire Rocky Mountain Front. We enthusiastically supported the idea which would protect one of the most important ecosystems left in the Northern Rocky Mountain region. Local landowners and representatives from several conservation organizations, local, state, tribal, and federal agencies participated in the meeting.

As suspected, there was lots of interest but also plenty of suspicion from landowners along the Front. Everyone agreed on the need to work together to maintain the rural lifestyle of the area. Residential subdivision and commercial development poses a major threat to the agricultural use of the area and its nationally significant wildlife habitat.

The group agreed to form a coalition to work together on resource issues and problems along the Front. A series of public meetings were held to move forward with the project. Known officially as the FRONTLANDERS, the group's mission statement reads as follows:

"In the shadow of the Rocky Mountain Front, the FRONTLANDERS promote a united, concerted, continuing effort for planning and sustainable use of area resources, with sensitivity toward historic values, with respect for property and personal rights, traditions and lifestyles, and with balance in the use of this "Last Best Place". "

We hope this group evolves into a successful organization similar to the Blackfoot Challenge. A number of subcommittees have formed to work on specific projects and problems. The key to the group's success depends upon participation from private landowners. Many of these individuals don't trust the participating federal agencies (FWS, BLM and Forest Service) and endangered species issues (primarily wolves and grizzly bears) continue to block any major progress.

The Partners For Wildlife (PFW) program will be an essential tool to develop credibility with landowners along the Front. Ultimately we feel that an extensive conservation easement program and proper land use planning will be the only way to protect this unique area.

3. Items of Interest

The Regional Realty meeting was held in Great Falls in May. Participants were given a tour of the Blackfoot and Mission valleys to view Service and private lands activities.

McCollum, Sullivan, and Stutzman traveled to Washington, DC in June to brief the Director designate, Deputy Director, Assistant Director for Ecological Services and other staff on the Blackfoot Watershed Initiative. The same briefing was given to a number of non-governmental

Regional Realty staff and Regional and National Partners for Wildlife staff being briefed on the Blackfoot Challenge by Land Lindbergh at Upsata Lake in Powell County.
JEM 05/93

Canada goose brood on a seasonal wetland near Doney Lake on Plum Creek corporate timberland in Powell County.
GLS 05/93

organizations including the Nature Conservancy, Trout Unlimited, the Wilderness Society, and the Wildlife Management Institute at the National Fish and Wildlife Foundation Headquarters. A $10,000 check from a Blackfoot Valley landowner was presented to the NFWF along with a framed Blackfoot River print to express our appreciation for the $200,000 NFWF grant for private lands projects in the valley. Montana's Private Lands Program is now recognized as the most innovative and successful in the country. Montana has led the way into an ecosystem approach for private lands work.

4. Credits

Johnson wrote the report with the exception of parts of E.7 and J.1. Stutzman wrote the remainder of E.7 and Sullivan wrote the remainder of J.1. McCollum edited and Benway assembled this report.